DUPLICATE

METEOROLOGICAL OFFICE
161690
LIBRARY

UK METEOROLOGICAL OFFICE GLOBAL DATA MONITORING REPORT

July, 93

Central Forecasting Division
Meteorological Office
London Rd
Bracknell
Berkshire
RG12 2SZ

This report has not been published. Permission to quote from it should be obtained from the Assistant Director of the above Meteorological Office Division

Distribution List

Mr J Brown	NMC, Victoria, Australia
Dr H W Christ	Deutscher Wetterdienst, Offenbach, Germany
Dr P Julian	NMC, Washington, USA
Mr E A Meindl	National Data Buoy Centre, Stennis Space Center, USA
Permanent Rep. with WMO	Moscow, CIS
Mr Nobuo Sato	JMA, Tokyo, Japan
Dr B Strauss	ECMWF, Reading, UK
Dr M J Uddstron	Met. Service, Wellington, New Zealand
Mr R S Bell	Met. Office, Bracknell, UK
Mr J R Leighton	Met. Office, Bracknell, UK
Mr R W Lunnon	Met. Office, Bracknell, UK
Mr A M Radford	Met. Office, Bracknell, UK
Mr D B Shaw	Met. Office, Bracknell, UK
Mr S G Smith	Met. Office, Bracknell, UK
Mr M W Stubbs	Met. Office, Bracknell, UK
National Meteorological Library	Met. Office, Bracknell, UK

CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

...oooOOOooo...

1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Mr A Radford
Observation Processing Manager
Central Forecasting Division
Meteorological Office
London Road
Bracknell
Berkshire
United Kingdom
RG12 2SZ

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIBU observations received per day thoughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12 UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Aircraft observations

TABLE 3 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Satellite Observations

Figures 8-22 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
8	Availability/average daily number	701-1000
9	Vector mean wind (observed)	701-1000
10	Observation-background vector wind difference	701-1000
11	Mean observation-background speed differences	701-1000
12	RMS observation-background vector difference	701-1000
13	Availability/average daily number	401-700
14	Vector mean wind (observed)	401-700
15	Observation-background vector wind difference	401-700
16	Mean observation-background speed differences	401-700
17	RMS observation-background vector difference	401-700
18	Availability/average daily number	101-400
19	Vector mean wind (observed)	101-400
20	Observation-background vector wind difference	101-400
21	Mean observation-background speed differences	101-400
22	RMS observation-background vector difference	101-400

Figures 23-25 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 26-28 show the same statistics for NOAA-12. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

Figure	Layer (hPa)
23/26	850-1000
24/27	100-300
25/28	30-50

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH:July, 93

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS $\geq$ 20 ,and one or more of the following:

1.|bias| $\geq$ 4 hPa (pressure),
$\geq$ 5 m s^{-1} (wind speed)
$\geq$ 30 degrees (direction).

2.SD $\geq$ 6 hPa (pressure)
$\geq$ 80 degrees (direction).

3.PGE $\geq$ 25.

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE									
C6BT8	ALL	MSLP	SUR	40	0	0	0.7	4.6	4.7
DMZL	ALL	MSLP	SUR	39	0	0	1.7	-5.8	6.1
DVCBTD	ALL	MSLP	SUR	55	35	64	2.9	-10.9	11.2
ELAD7	ALL	MSLP	SUR	21	20	95	0.0	-14.5	14.5
KPTB	ALL	MSLP	SUR	29	0	0	1.2	5.1	5.3
LAOO4	ALL	MSLP	SUR	20	0	0	1.6	6.7	6.9
NFMK	ALL	MSLP	SUR	20	0	0	1.3	4.2	4.4
OWOG2	ALL	MSLP	SUR	70	0	0	1.6	4.7	4.9
SXMA	ALL	MSLP	SUR	30	0	0	4.1	5.3	6.7
TEST	ALL	MSLP	SUR	31	2	6	6.3	0.7	6.4
UFAA	ALL	MSLP	SUR	24	0	0	1.1	5.2	5.3
UFJN	ALL	MSLP	SUR	23	0	0	2.2	-4.0	4.6
UHLW	ALL	MSLP	SUR	22	0	0	1.2	-12.1	12.2
UIIG	ALL	MSLP	SUR	47	0	0	2.6	-4.0	4.8
UQRA	ALL	MSLP	SUR	21	0	0	1.7	6.6	6.8
USNG	ALL	MSLP	SUR	33	1	3	1.0	5.2	5.3
USZQ	ALL	MSLP	SUR	26	0	0	3.2	-6.4	7.2
WQZ9670	ALL	MSLP	SUR	32	0	0	1.5	4.5	4.7
WTC9408	ALL	MSLP	SUR	29	1	3	1.4	4.5	4.7
WZE4928	ALL	MSLP	SUR	38	38	100	0.0	0.0	0.0
ZBWP	ALL	MSLP	SUR	55	0	0	1.6	4.0	4.3
ZCAM9	ALL	MSLP	SUR	64	0	0	2.6	6.5	7.0
3EIM3	ALL	MSLP	SUR	28	0	0	1.2	-4.7	4.9
3EZH7	ALL	MSLP	SUR	31	0	0	6.3	3.1	7.1
WIND SPEED									
BMEJ	ALL	SPEED	SUR	23	0	0	6.6	8.4	10.7
D5ND	ALL	SPEED	SUR	21	0	0	4.5	5.1	6.8
ELHX3	ALL	SPEED	SUR	20	0	0	2.9	7.5	8.0
FNQM	ALL	SPEED	SUR	68	5	7	5.9	9.6	11.2
VMAL	ALL	SPEED	SUR	39	0	0	6.7	5.7	8.8
VVGQ	ALL	SPEED	SUR	22	0	0	5.3	7.0	8.8
9KLE	ALL	SPEED	SUR	38	0	0	3.9	5.5	6.7
WIND DIRECTION									
DVCBTD	ALL	DIRN.	SUR	25	0	0	111.8	10.1	112.3
D5ND	ALL	DIRN.	SUR	20	0	0	74.9	-32.2	81.5
WECB	ALL	DIRN.	SUR	29	0	0	87.8	-29.4	92.6
22001	ALL	DIRN.	SUR	87	0	0	25.7	41.1	48.5

AVAILABILITY - SHIP/SYNOP - JULY 93

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 19293

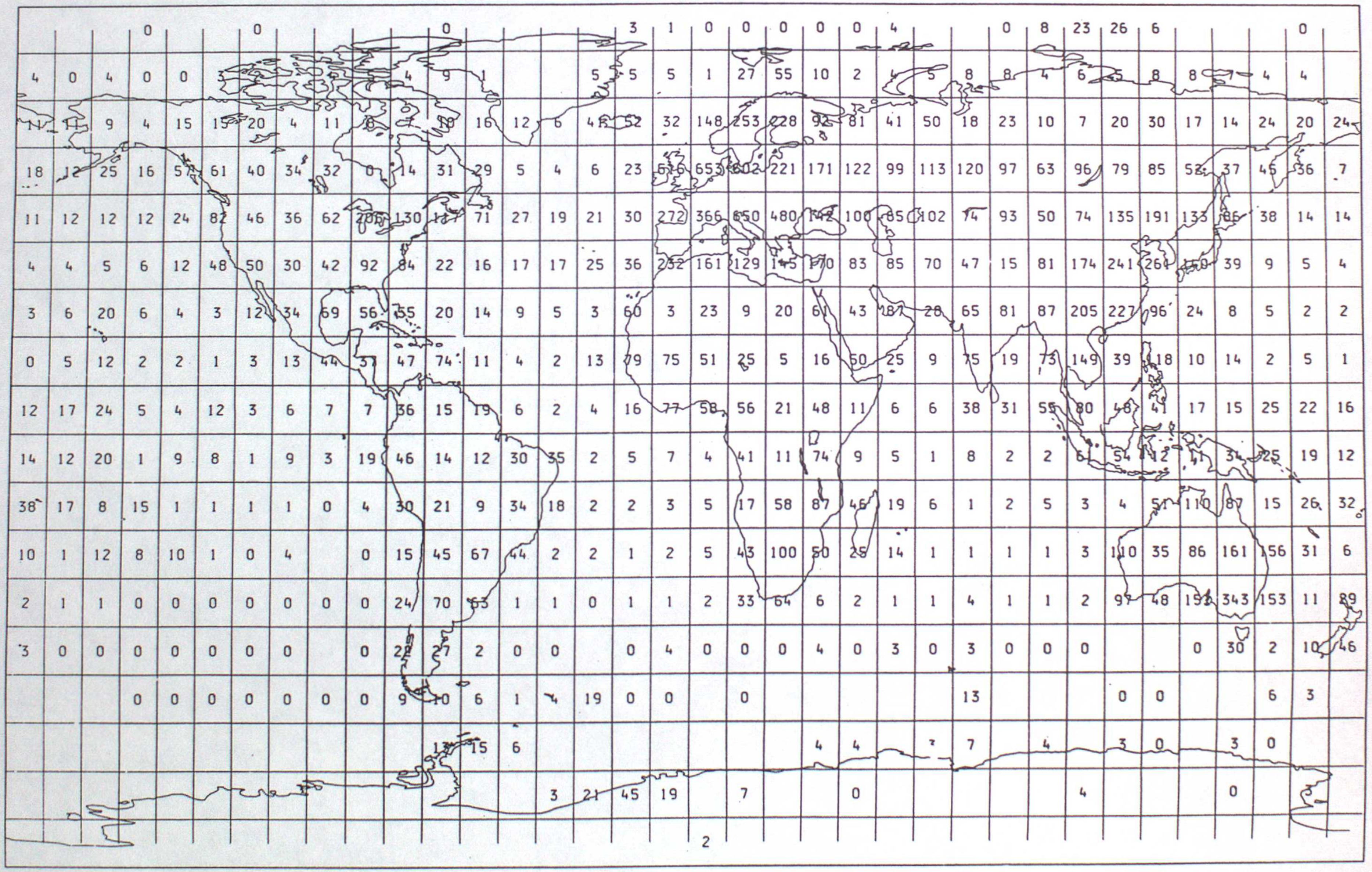

0 0 0 3 1 0 0 0 0 0 4 0 8 23 26 6 0
4 0 4 0 0 3 4 9 1 5 5 5 1 27 55 10 2 4 5 8 8 4 6 5 8 8 7 4 4
11 11 9 4 15 15 20 4 11 8 7 10 16 12 6 45 52 32 148 253 228 92 81 41 50 18 23 10 7 20 30 17 14 24 20 24
18 12 25 16 57 61 40 34 32 0 14 31 29 5 4 6 23 616 653 602 221 171 122 99 113 120 97 63 96 79 85 52 37 45 36 7
11 12 12 12 24 82 46 36 62 206 130 117 71 27 19 21 30 272 366 650 480 142 100 85 102 74 93 50 74 135 191 133 86 38 14 14
4 4 5 6 12 48 50 30 42 92 84 22 16 17 17 25 36 232 161 129 145 170 83 85 70 47 15 81 174 241 264 150 39 9 5 4
3 6 20 6 4 3 12 34 69 56 55 20 14 9 5 3 60 3 23 9 20 61 43 187 28 65 81 87 205 227 96 24 8 5 2 2
0 5 12 2 2 1 3 13 44 37 47 74 11 4 2 13 79 75 51 25 5 16 50 25 9 75 19 73 149 39 118 10 14 2 5 1
12 17 24 5 4 12 3 6 7 7 36 15 19 6 2 4 16 77 58 56 21 48 11 6 6 38 31 55 80 48 41 17 15 25 22 16
14 12 20 1 9 8 1 9 3 19 46 14 12 30 35 2 5 7 4 41 11 74 9 5 1 8 2 2 61 54 12 41 34 25 19 12
38 17 8 15 1 1 1 1 0 4 30 21 9 34 18 2 2 3 5 17 58 87 46 19 6 1 2 5 3 4 51 110 87 15 26 32
10 1 12 8 10 1 0 4 0 15 45 67 44 2 2 1 2 5 43 100 50 25 14 1 1 1 1 3 110 35 86 161 156 31 6
2 1 1 0 0 0 0 0 0 0 24 70 63 1 1 0 1 1 2 33 64 6 2 1 1 4 1 1 2 97 48 192 343 153 11 89
3 0 0 0 0 0 0 0 0 22 27 2 0 0 0 4 0 0 0 4 0 3 0 3 0 0 0 0 30 2 10 46
0 0 0 0 0 0 0 9 10 6 1 4 19 0 0 0 13 0 0 6 3
13 15 6 4 4 7 4 3 0 3 0
3 21 45 19 7 0 4 0 3
2

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH:July, 93

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoys.
Standard of comparison		:Background field from Bracknell global model.
Position		:Average Latitude and Longitude for period.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa) :Wind speed (m s^{-1}), :Wind direction (degrees).
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
	:25 m s^{-1}	(vector wind)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:

1. |bias|	≥ 4 hPa	(pressure).
	≥ 5 m s^{-1}	(wind speed).
	≥ 30 degrees	(direction).
2. SD	≥ 6 hPa	(pressure).
	≥ 80 degrees	(direction).
3. PGE	≥ 25.	

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE											
25551	84.1	37.1	ALL	MSLP	SUR	38	0	0	3.8	4.0	5.5
33021	-59.4	-27.3	ALL	MSLP	SUR	594	6	1	4.0	-4.7	6.2
44778	55.2	-45.7	ALL	MSLP	SUR	39	1	3	2.0	9.0	9.2
44779	53.7	-48.3	ALL	MSLP	SUR	26	0	0	2.7	8.5	8.9
63161	77.1	-21.9	ALL	MSLP	SUR	68	68	100	0.0	0.0	0.0
64925	64.5	-12.1	ALL	MSLP	SUR	21	17	81	10.9	4.3	11.7
71003	-79.0	-28.0	ALL	MSLP	SUR	545	545	100	0.0	0.0	0.0
74002	-72.1	-2.5	ALL	MSLP	SUR	469	204	43	1.9	-11.9	12.0
WIND DIRECTION											
42026	29.2	-94.0	ALL	DIRN.	SUR	36	0	0	83.3	-61.9	103.7
51015	5.0	-124.9	ALL	DIRN.	SUR	80	0	0	33.3	-30.8	45.3
52003	6.4	168.9	ALL	DIRN.	SUR	21	0	0	61.2	-39.9	73.0
52006	8.0	165.0	ALL	DIRN.	SUR	67	0	0	26.6	-39.9	48.0
52314	4.9	137.0	ALL	DIRN.	SUR	27	0	0	122.6	49.6	132.2
55589	-25.2	159.6	ALL	DIRN.	SUR	165	0	0	36.5	-39.9	54.1

AVAILABILITY - DRIBU - JULY 93

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 2709

FIGURE 2

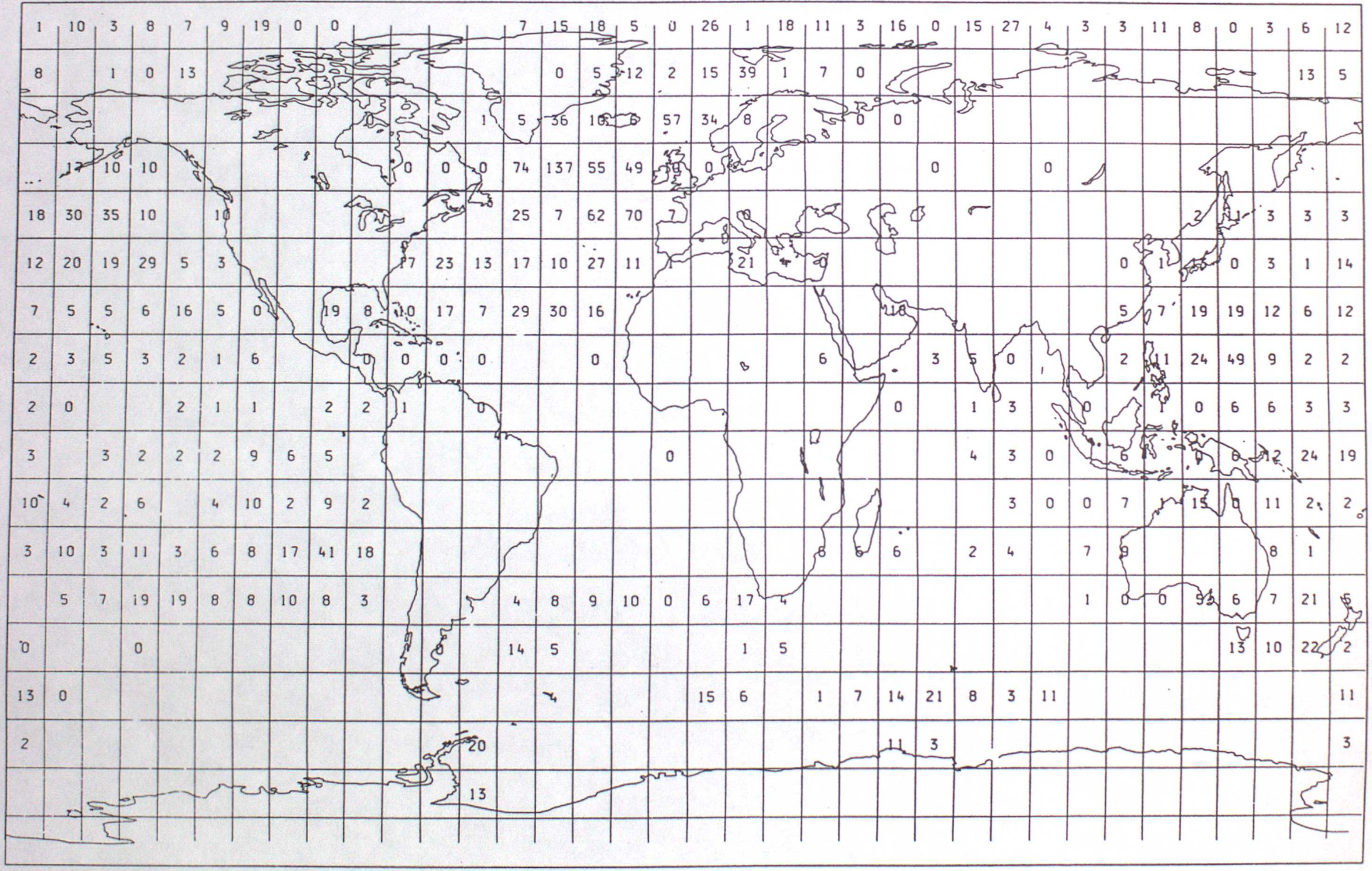

1 10 3 8 7 9 19 0 0 7 15 18 5 0 26 1 18 11 3 16 0 15 27 4 3 3 11 8 0 3 6 12
8 1 0 13 0 5 12 2 15 39 1 7 0 13 5
1 5 36 16 6 57 34 8 0 0
17 10 10 0 0 0 74 137 55 49 19 0 0 0
18 30 35 10 10 25 7 62 70 7 0 2 1 3 3 3
12 20 19 29 5 3 17 23 13 17 10 27 11 1 21 0 0 1 0 3 1 14
7 5 5 6 16 5 0 19 8 10 17 7 29 30 16 18 5 7 19 19 12 6 12
2 3 5 3 2 1 6 0 0 0 0 0 6 3 5 0 2 11 24 49 9 2 2
2 0 2 1 1 2 2 1 0 0 1 3 0 1 0 6 6 3 3
3 3 2 2 2 9 6 5 0 4 3 0 6 6 12 24 19
10 4 2 6 4 10 2 9 2 3 0 0 7 1 15 0 11 2 2
3 10 3 11 3 6 8 17 41 18 6 6 6 2 4 7 9 8 1
5 7 19 19 8 8 10 8 3 4 8 9 10 0 6 17 4 1 0 0 9 6 7 21 5
0 0 14 5 1 5 13 10 22 2
13 0 4 15 6 1 7 14 21 8 3 11 11
2 20 11 3 3
13

TABLE 3

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:July, 93

Monitoring procedures:
Period :One calendar month.
Data monitored :Statistics for each airline carrier.
Area monitored :90°N - 90°S, 180°W - 180°E.
Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored
:N REP. :Number of observations received excluding duplicates.
:PG :Percentage of observations with gross errors.
:PR :Percentage of observations rejected by quality control.
:PC :Percentage of observations with calm winds.
:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

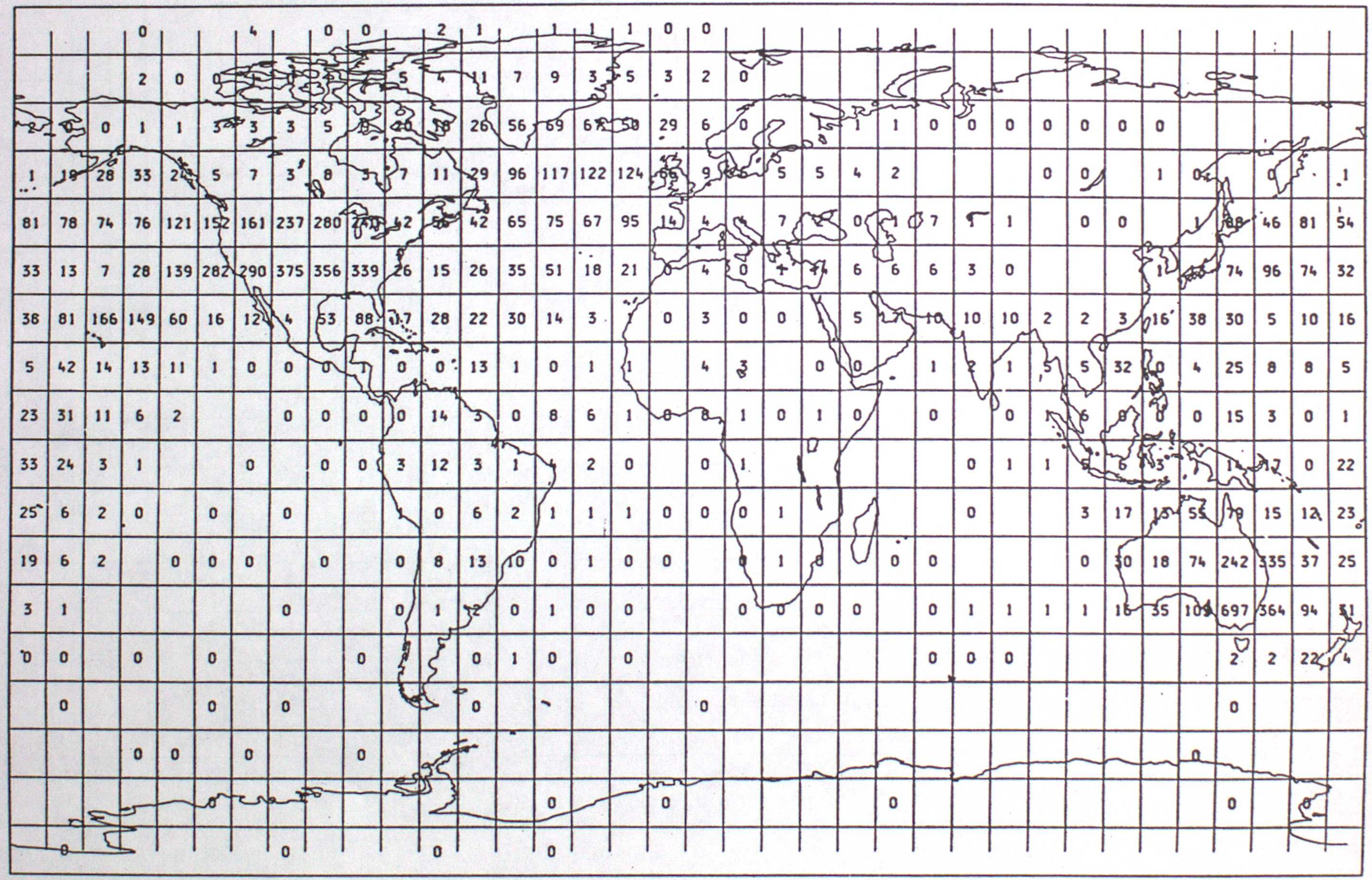
SELECTION CRITERIA :N REP $\geq$ 20

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	4114	1	12	1.6	0.1	4085	0	13	1	7.8	1.5
AAN	181	1	2	1.7	-0.4	172	0	3	0	8.6	1.0
AAR	1432	1	15	1.8	-0.4	1423	0	16	0	8.2	2.0
AAU	20	0	5	1.3	0.5	20	0	5	0	5.8	0.2
ACA	971	1	3	2.4	-0.1	986	0	3	1	7.4	0.8
ACI	67	1	3	1.5	0.3	67	0	0	0	6.7	0.8
ACU	84	1	1	1.4	-0.8	84	0	2	0	9.5	1.3
AEA	270	1	4	1.8	0.0	258	0	5	0	8.5	2.3
AEL	335	1	4	1.8	0.4	335	0	3	0	8.6	0.9
AFL	170	5	16	3.9	2.4	165	0	18	4	12.3	-0.4
AFR	948	1	6	1.9	0.0	945	0	7	1	7.8	1.6
AMT	329	2	27	2.3	0.0	360	0	25	0	7.9	1.7
AMX	620	4	5	1.9	0.3	618	0	4	0	9.6	1.4
ANA	940	0	15	1.9	0.1	937	0	16	0	8.1	2.0
ANO	31	0	48	1.9	-1.3	31	0	45	0	10.9	6.4
ANZ	3876	1	8	1.9	-0.1	3816	0	9	1	8.1	1.7
AOM	549	1	4	1.5	0.5	550	0	4	1	7.2	1.1
ARG	176	4	14	2.9	0.0	173	1	13	0	15.5	4.2
ARP	480	0	9	1.6	0.4	462	0	9	2	6.3	1.3
ASY	33	3	9	1.5	-0.3	28	0	14	7	10.0	1.1
AUA	79	0	4	2.1	-1.0	79	0	4	0	9.2	3.0
AVA	407	1	2	2.0	-0.2	409	0	2	0	8.5	2.0
AVN	36	0	8	1.0	-0.1	36	0	8	0	6.3	2.2
AZA	663	0	2	1.8	0.1	661	0	2	0	7.9	1.9
BAL	182	0	25	1.6	-0.3	181	0	24	0	8.6	1.7
BAW	989	1	4	2.0	-0.2	994	0	5	1	7.0	1.8
BWA	504	2	2	1.8	1.0	509	0	3	1	7.7	1.7
CAL	2407	0	14	1.7	-0.1	2399	0	16	1	8.8	1.8
CCA	344	1	16	2.8	0.4	342	1	17	1	10.5	2.0
CDN	2363	0	12	2.0	0.1	2351	0	13	1	7.8	1.7
CES	243	0	14	1.6	0.2	244	0	16	0	10.7	2.2
CFG	527	0	3	1.9	-0.7	530	0	4	1	8.3	1.5
CKS	127	1	28	2.5	-0.2	132	0	25	0	9.5	2.2
CKT	41	0	7	1.9	0.7	40	0	13	0	10.3	1.5
CMI	2014	2	17	2.3	0.5	2008	0	19	2	8.2	1.7
CMM	222	1	5	1.8	-0.4	224	0	6	0	9.6	1.6
CNB	68	1	3	2.2	-0.4	68	0	1	0	9.3	1.7
COA	2759	1	16	1.7	0.4	2654	0	18	2	7.0	1.1
CPA	486	1	5	1.7	0.0	469	0	6	1	8.0	1.4
CRL	269	0	1	1.6	0.4	269	0	5	2	7.6	1.4
CSN	33	3	24	3.0	-0.9	33	0	21	0	7.5	1.5
CTM	297	0	33	3.3	-2.2	298	0	33	1	7.6	1.2
CUB	231	1	17	2.7	1.2	232	0	18	0	10.9	2.0
CWC	26	0	4	1.9	1.1	25	0	4	0	11.3	5.0
DAE	23	4	0	1.5	1.0	21	0	5	5	6.0	-0.1
DAL	6288	0	15	1.9	0.5	6032	0	16	0	7.6	1.6
DHL	107	2	7	1.9	0.4	107	0	22	0	15.8	3.1
DLH	2750	0	5	2.1	-0.4	2741	0	12	7	7.8	1.2
DOA	83	1	8	1.8	-0.2	83	0	8	0	6.0	1.1
EIA	152	1	9	2.7	1.1	153	0	8	2	12.1	2.0
ELY	145	0	2	1.7	-0.5	149	0	2	0	7.2	1.2
EVA	860	0	16	2.0	-0.9	856	0	16	0	8.3	1.6
FDX	1185	1	8	1.8	0.2	1189	0	8	0	7.9	1.5
FIN	594	0	1	2.1	0.0	601	0	4	2	8.0	2.0
FJI	484	2	3	1.7	0.8	482	0	1	0	7.6	1.9
FKE	28	0	4	2.9	0.3	28	0	4	0	11.1	4.9
GAF	143	2	2	2.2	0.1	143	0	2	1	9.1	2.3
GIA	407	1	5	1.5	0.5	402	0	5	0	8.1	1.5
HAL	1892	0	25	1.7	0.3	1837	0	26	2	8.3	1.7

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
HLF	136	0	2	1.5	-0.7	136	0	2	0	6.7	0.6
IBE	2977	1	15	1.8	0.1	2936	0	17	1	8.5	1.5
ICE	404	0	1	1.8	-0.1	404	0	1	1	7.3	2.0
ICX	26	0	0	2.6	-1.5	26	0	0	0	7.1	2.3
JAA	49	2	6	2.2	1.6	48	0	2	0	8.2	2.2
JAL	6466	0	14	1.7	0.4	6440	0	15	1	8.2	1.8
JAS	115	0	10	1.2	0.4	114	0	12	0	7.7	1.3
JAZ	87	1	25	1.5	0.8	87	0	25	1	6.2	0.5
KAL	4349	1	14	1.7	-0.1	4334	0	15	0	8.4	1.8
KIW	22	0	9	2.2	1.3	22	0	18	0	10.0	0.6
KLM	1780	0	1	1.8	0.1	1789	0	2	1	7.2	1.8
LAN	107	3	5	2.0	-0.3	104	0	9	1	11.5	2.2
LAP	77	5	17	3.2	-0.2	76	3	26	0	22.4	4.6
LCO	84	12	23	3.5	-0.1	83	0	17	0	17.1	3.2
LDA	210	0	11	2.2	-1.4	216	0	11	0	7.4	1.4
LDI	27	0	0	1.5	-1.2	27	0	0	0	6.0	1.4
LIB	146	1	2	1.5	-0.7	149	0	3	1	7.1	1.4
LLB	57	0	4	2.3	0.4	55	0	5	0	15.0	3.5
LOT	561	1	3	2.2	-0.3	563	0	2	0	8.3	1.6
LTU	432	1	3	1.7	0.4	417	0	3	1	7.3	2.4
MAH	126	2	8	2.2	-0.6	124	0	10	0	9.7	0.5
MAS	525	0	13	1.8	0.6	520	0	13	0	8.7	2.1
MDA	153	0	8	2.5	1.5	153	0	8	0	8.6	2.4
MPH	488	1	2	1.7	-0.1	483	0	2	0	8.1	2.0
MTQ	226	0	23	1.3	0.3	230	0	23	0	6.7	1.4
NCA	928	1	12	1.7	0.1	922	0	14	1	8.1	1.7
NGA	162	4	4	1.9	0.9	164	1	5	0	13.2	1.0
NWA	13447	1	11	2.2	0.2	13321	0	12	1	8.3	1.5
PAL	1160	7	20	2.0	-0.2	1129	0	20	3	7.7	1.1
PAO	717	2	12	1.8	0.3	709	0	11	0	8.4	1.0
PAT	32	0	31	4.2	-3.3	33	0	30	0	9.0	1.8
QFA	3106	0	9	1.7	0.2	3061	0	10	1	8.0	1.5
RAF	253	0	2	1.9	0.1	252	0	4	1	10.1	3.3
RBA	35	6	3	1.3	0.7	35	0	0	0	6.7	0.4
RIA	54	2	11	4.6	3.6	56	0	11	0	11.0	2.3
RJA	20	5	15	4.8	-0.8	20	0	15	0	9.6	0.8
RKA	112	3	5	1.7	0.8	110	0	3	0	7.9	1.8
RON	88	1	6	1.9	1.1	85	0	6	1	7.8	0.4
ROY	39	0	3	2.7	0.0	39	0	0	0	7.6	1.0
RRR	236	1	17	2.4	-0.2	240	0	19	2	8.1	1.4
SAA	202	1	2	1.9	-0.4	200	0	4	1	8.4	1.2
SAS	2348	0	1	2.1	-0.2	2339	0	4	2	7.3	1.7
SAW	73	0	1	3.2	2.0	72	0	1	0	6.9	1.8
SIA	1749	0	14	1.6	-0.2	1737	0	15	1	8.0	1.6
SOL	96	1	3	1.6	0.1	94	0	2	0	7.0	1.4
SPP	211	1	2	1.6	0.0	198	0	2	1	7.7	1.5
SSR	21	10	0	3.0	2.3	20	0	5	5	8.1	2.6
SVA	118	2	6	1.8	-0.4	131	0	7	1	8.6	1.7
SWR	157	4	10	2.0	0.4	153	0	8	0	10.4	1.1
TAP	890	1	2	1.9	-0.2	888	0	4	0	8.6	1.9
TBA	66	6	11	3.2	0.9	66	0	3	2	9.7	2.6
TEJ	68	7	28	1.6	-0.4	68	0	28	0	6.8	1.1
THA	554	0	17	1.7	0.3	550	0	18	0	8.7	2.2
TOW	123	1	2	1.4	-0.2	125	0	3	0	9.1	1.3
TRH	74	0	22	1.2	0.5	65	0	29	2	6.3	0.1
TSC	51	0	18	1.5	-0.2	56	0	20	0	11.7	4.4
TWA	1004	1	5	2.1	0.5	993	0	5	0	8.0	1.5
UAL	79922	2	5	1.3	0.0	79825	0	4	0	6.8	0.9
ULE	304	1	1	2.1	0.0	309	0	2	0	8.0	1.7

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
UPS	992	2	25	2.1	-0.5	990	0	26	0	8.5	1.2
VIA	860	0	9	1.8	0.3	859	0	11	2	8.1	2.0
VIR	25	0	0	2.4	-1.0	26	0	0	0	9.3	3.8
VRG	736	2	6	2.3	0.2	729	0	5	0	12.3	2.4
VSP	158	3	17	1.5	0.7	156	0	17	1	9.6	1.8
WOA	100	3	11	1.9	0.1	99	0	8	0	9.4	1.4
AL	1197	1	1	1.4	0.5	1129	0	1	0	6.1	0.4
AN	44621	0	44	1.5	0.3	44228	0	44	0	7.7	2.3
BA	12884	0	6	1.8	0.8	12869	0	6	0	7.3	1.4
CO	6032	0	38	1.5	0.8	6003	0	38	0	6.5	1.3
DL	4577	2	3	1.5	0.6	4575	0	18	17	10.8	-1.4
KL	3732	0	100	2.4	1.9	3732	0	15	0	7.1	1.7
LH	3154	0	19	1.7	0.5	3144	0	20	0	6.9	1.4
MA	25	4	12	3.9	1.5	25	0	4	0	10.5	2.2
QF	11254	0	38	1.4	0.5	11252	0	38	0	6.8	1.5
RE	105	3	7	3.6	2.6	87	0	5	0	10.4	1.1
UA	4023	2	33	1.6	-0.3	3767	0	35	0	8.9	2.0
WA	1098	20	100	1.8	0.2	981	1	100	51	15.0	-8.2
XX	3332	2	100	1.6	0.7	3327	0	100	2	10.9	1.7
E	39	0	26	3.3	2.4	39	0	26	0	6.6	0.6
M	276	1	24	3.3	2.6	282	0	22	0	8.2	2.1
N	355	1	11	2.6	0.3	372	0	11	1	8.7	2.1

MEAN DAILY COUNT OF AIREPS AND ASDARS 70 - 500 HPA FIGURE 3
JULY 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED


0 4 0 0 2 1 1 1 1 0 0
2 0 0 5 4 11 7 9 3 5 3 2 0
2 0 0 1 1 3 3 3 5 0 20 18 26 56 69 67 50 29 6 0 1 1 0 0 0 0 0 0 0
1 19 28 33 24 5 7 3 8 5 7 11 29 96 117 122 124 66 9 5 5 5 4 2 0 0 1 0 0 1
81 78 74 76 121 152 161 237 280 240 42 56 42 65 75 67 95 14 4 4 7 2 0 1 7 1 1 0 0 1 88 46 81 54
33 13 7 28 139 282 290 375 356 339 26 15 26 35 51 18 21 0 4 0 4 6 6 6 3 0 1 16 74 96 74 32
38 81 166 149 60 16 12 4 53 88 17 28 22 30 14 3 1 0 3 0 0 1 5 7 10 10 10 2 2 3 16 38 30 5 10 16
5 42 14 13 11 1 0 0 0 1 0 0 13 1 0 1 1 4 3 0 0 1 2 1 5 5 32 0 4 25 8 8 5
23 31 11 6 2 0 0 0 0 14 3 0 8 6 1 0 8 1 0 1 0 0 0 1 6 0 0 0 15 3 0 1
33 24 3 1 0 0 0 3 12 3 1 4 2 0 0 1 0 1 1 5 6 3 1 17 0 22
25 6 2 0 0 0 1 0 6 2 1 1 1 0 0 0 1 0 3 17 13 55 79 15 12 23
19 6 2 0 0 0 0 0 8 13 10 0 1 0 0 0 1 0 0 0 0 30 18 74 242 335 37 25
3 1 0 0 1 2 0 1 0 0 0 0 0 0 1 1 1 1 16 35 109 697 364 94 31
0 0 0 0 0 0 1 0 0 0 0 0 2 2 22 4
0 0 0 0 0 0
0 0 0 0 0
0 0 0 0 0 0
0 0 0 0

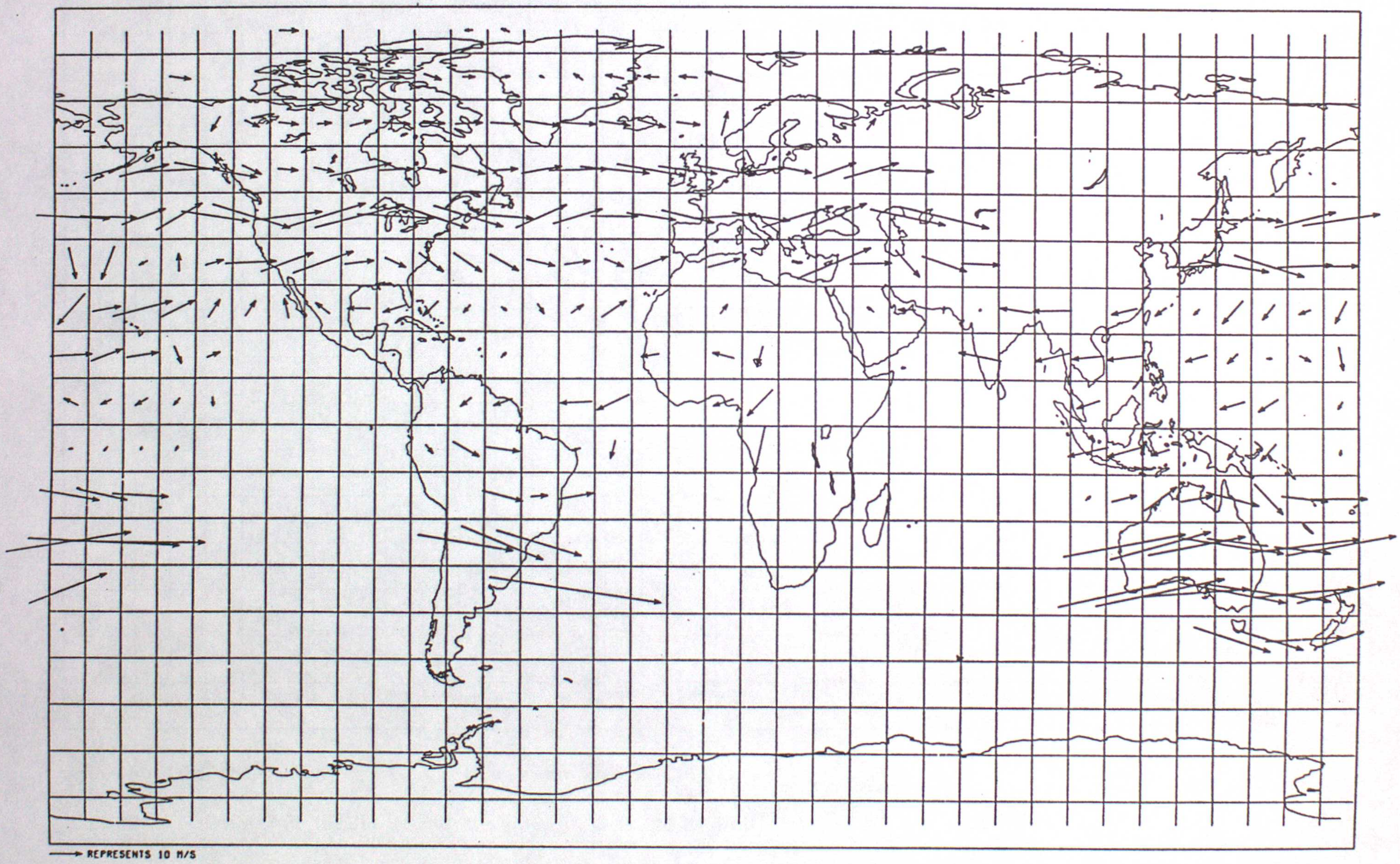
AIREPS & ASDARS MEAN WINDS BETWEEN 70 AND 500 HPA

JULY 1993

OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

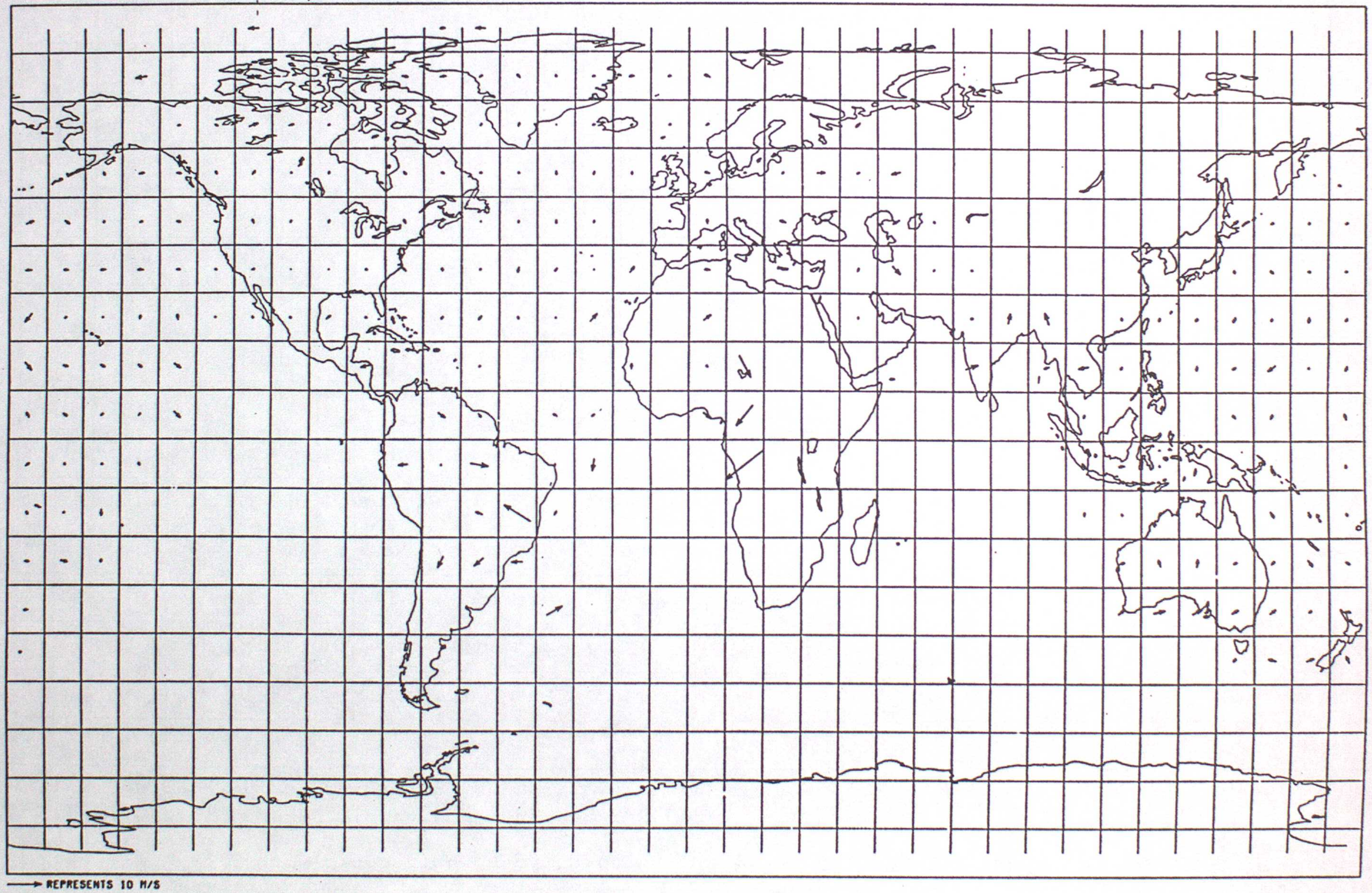
FIGURE 4



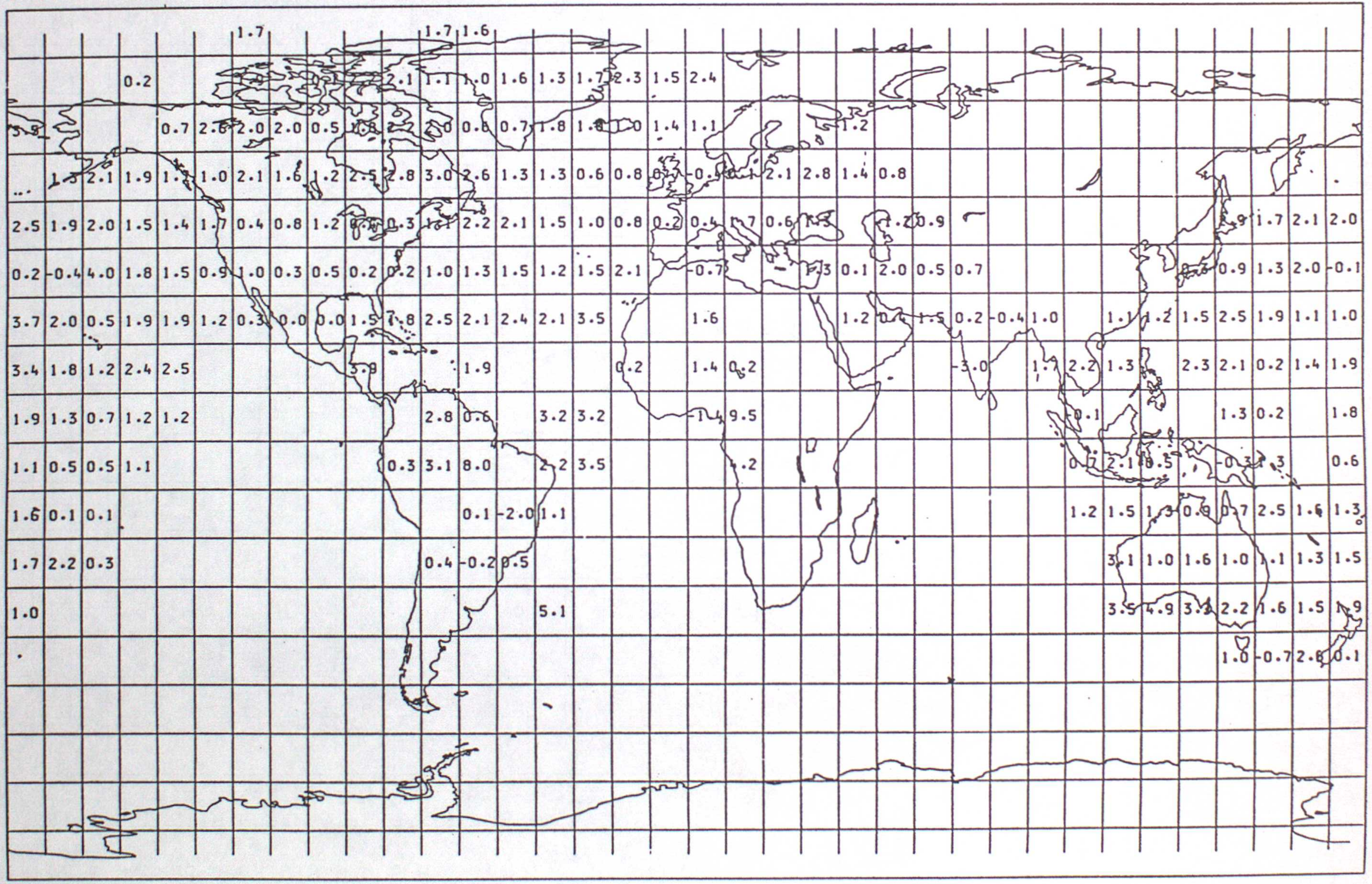
AIREPS & ASDARS MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

JULY 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



AIREPS & ASDARS : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JULY 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

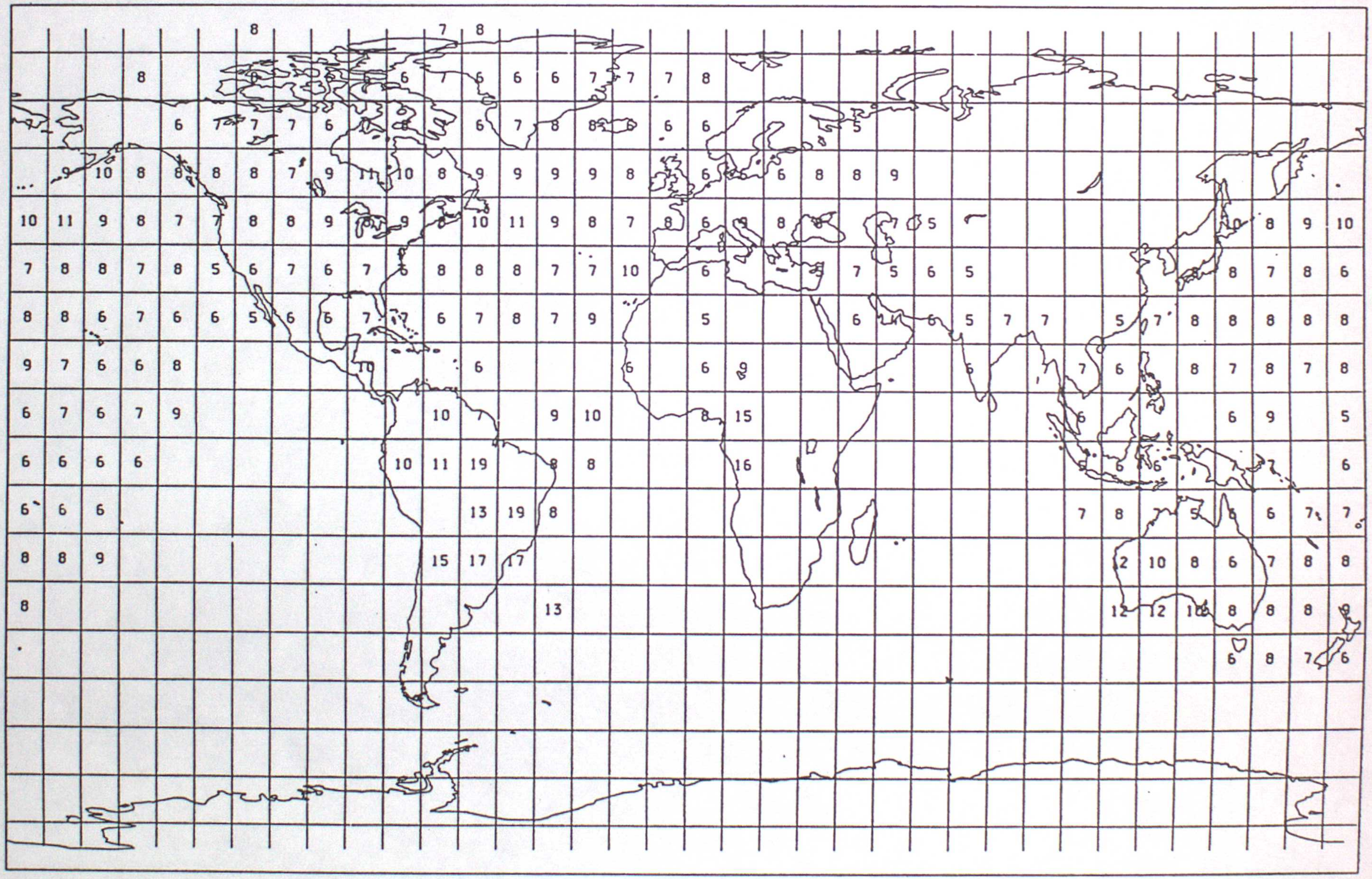

1.7 1.7 1.6
0.2 2.1 1.1 1.0 1.6 1.3 1.7 2.3 1.5 2.4
3.9 0.7 2.6 2.0 2.0 0.5 0.8 0.7 1.8 1.8 1.4 1.1 1.2
1.3 2.1 1.9 1.0 2.1 1.6 1.2 2.5 2.8 3.0 2.6 1.3 1.3 0.6 0.8 -0.4 2.1 2.8 1.4 0.8
2.5 1.9 2.0 1.5 1.4 1.7 0.4 0.8 1.2 0.3 2.2 2.1 1.5 1.0 0.8 0.2 0.4 0.6 1.2 0.9 1.9 1.7 2.1 2.0
0.2 -0.4 4.0 1.8 1.5 0.9 1.0 0.3 0.5 0.2 0.2 1.0 1.3 1.5 1.2 1.5 2.1 -0.7 1.3 0.1 2.0 0.5 0.7 0.9 1.3 2.0 -0.1
3.7 2.0 0.5 1.9 1.9 1.2 0.3 0.0 0.0 1.5 1.8 2.5 2.1 2.4 2.1 3.5 1.6 1.2 1.5 0.2 -0.4 1.0 1.1 1.2 1.5 2.5 1.9 1.1 1.0
3.4 1.8 1.2 2.4 2.5 3.9 1.9 0.2 1.4 0.2 -3.0 1.7 2.2 1.3 2.3 2.1 0.2 1.4 1.9
1.9 1.3 0.7 1.2 1.2 2.8 0.6 3.2 3.2 -1.4 9.5 -0.1 1.3 0.2 1.8
1.1 0.5 0.5 1.1 0.3 3.1 8.0 2.2 3.5 1.2 0.7 2.1 0.5 -0.3 1.3 0.6
1.6 0.1 0.1 0.1 -2.0 1.1 1.2 1.5 1.3 0.9 0.7 2.5 1.6 1.3
1.7 2.2 0.3 0.4 -0.2 0.5 3.1 1.0 1.6 1.0 1.1 1.3 1.5
1.0 5.1 3.5 4.9 3.3 2.2 1.6 1.5 1.9
1.0 -0.7 2.8 0.1

AIREPS & ASDARS : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7

JULY 1993

OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


8 7 8
8 6 7 6 6 6 7 7 7 8
7 6 7 7 7 6 8 6 7 8 8 6 6 6 5
9 10 8 8 8 8 7 9 11 10 8 9 9 9 9 8 6 6 8 8 9
10 11 9 8 7 7 8 8 9 8 9 8 10 11 9 8 7 8 6 9 8 8 7 5 10 8 9 10
7 8 8 7 8 5 6 7 6 7 6 8 8 8 7 7 10 6 5 7 5 6 5 8 8 7 8 6
8 8 6 7 6 6 5 6 6 7 7 6 7 8 7 9 5 6 6 5 7 7 5 7 8 8 8 8 8
9 7 6 6 8 10 6 6 6 9 6 7 7 6 8 7 8 7 8
6 7 6 7 9 10 7 9 10 8 15 6 6 9 5
6 6 6 6 10 11 19 8 8 16 5 6 6 7 6
6 6 6 13 19 8 7 8 7 5 6 6 7 7
8 8 9 15 17 17 12 10 8 6 7 8 8
8 13 12 12 10 8 8 8 9
6 8 7 6

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: July, 93

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer:
701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

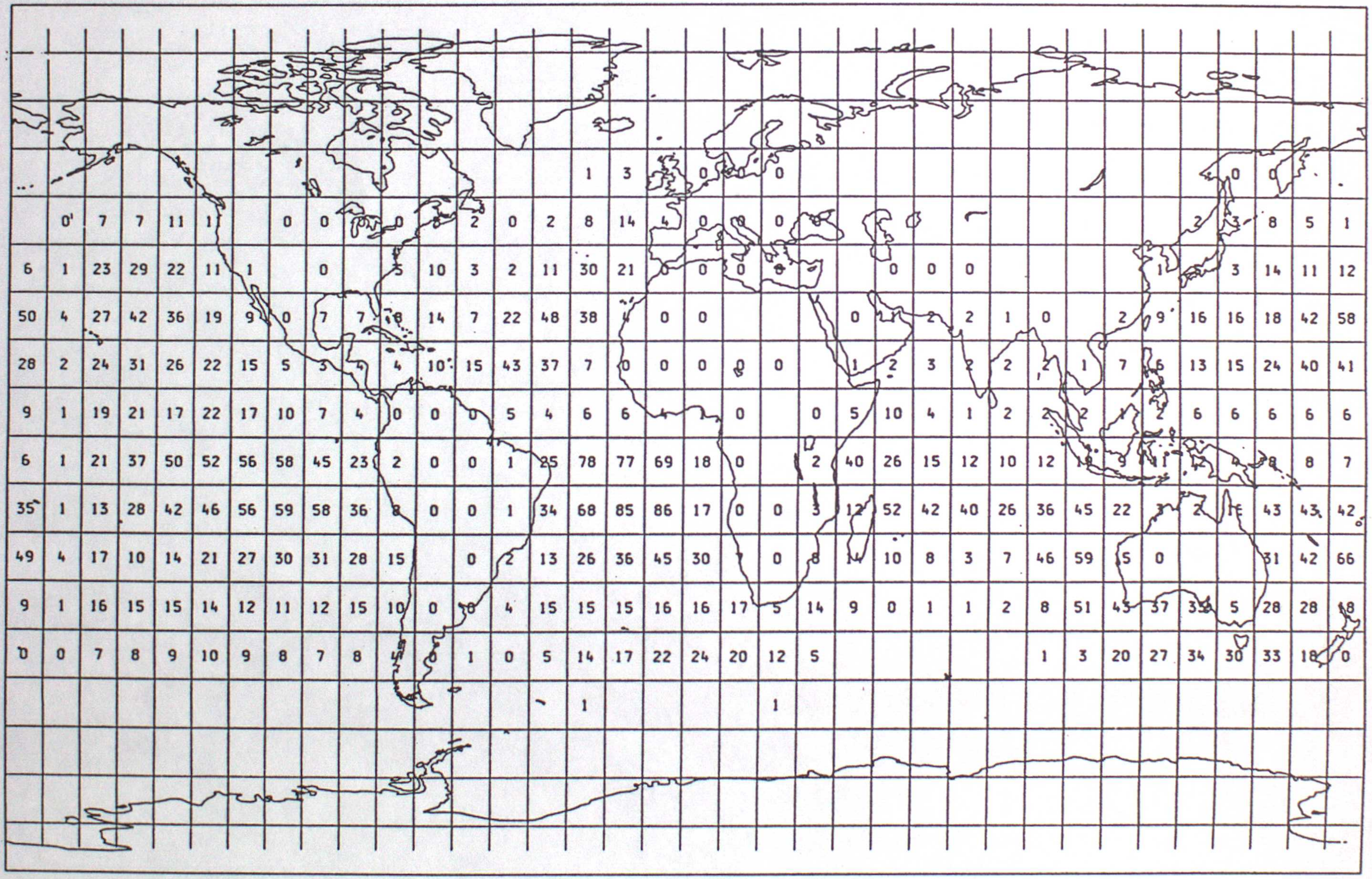
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

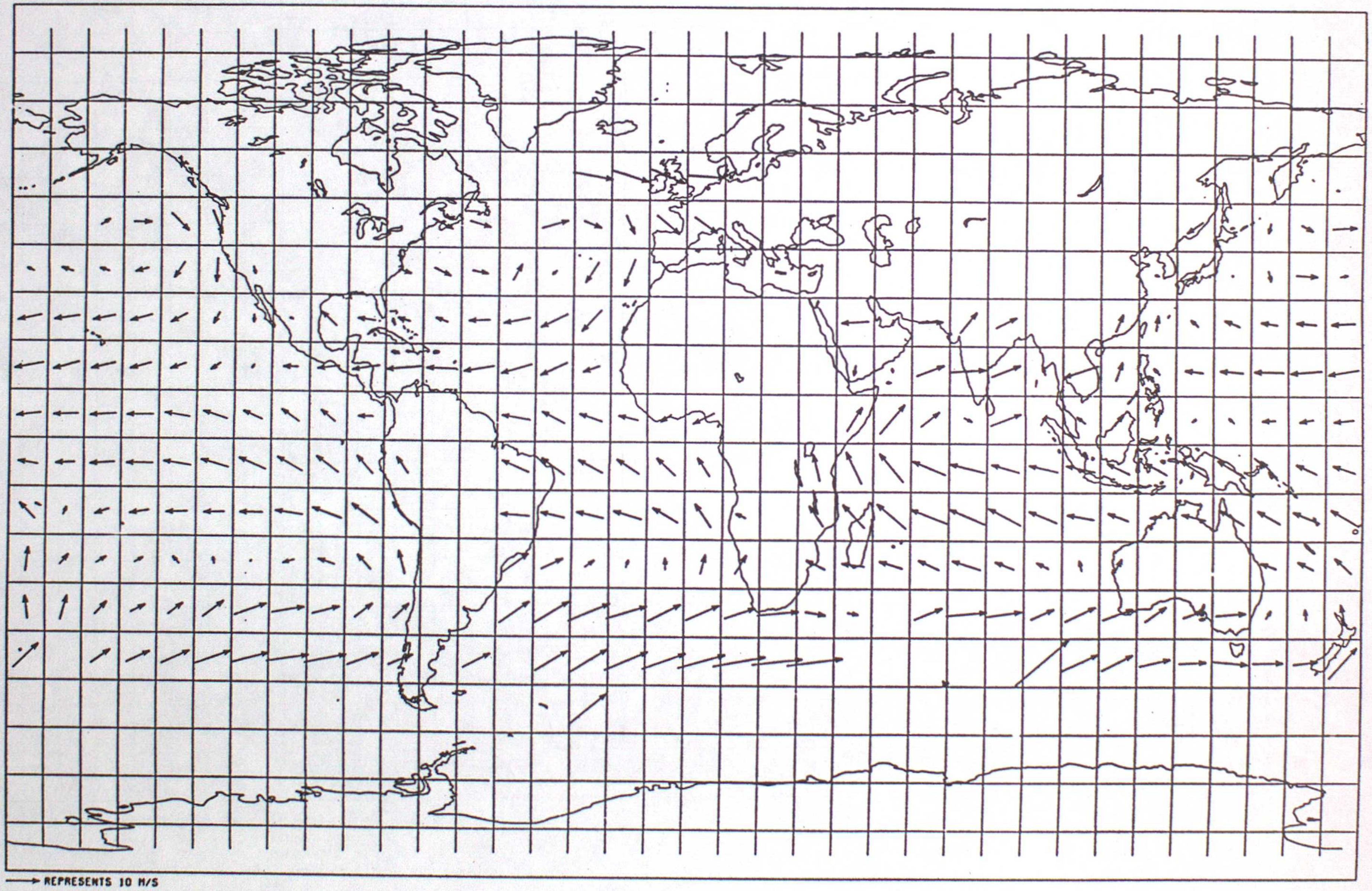
:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 8
JULY 1993


1 3 0 0 0 0 0
0 7 7 11 1 0 0 0 0 2 0 2 8 14 4 0 0 0 2 3 8 5 1
6 1 23 29 22 11 1 0 5 10 3 2 11 30 21 0 0 0 0 0 0 0 1 3 14 11 12
50 4 27 42 36 19 9 0 7 7 8 14 7 22 48 38 4 0 0 0 2 2 1 0 2 9 16 16 18 42 58
28 2 24 31 26 22 15 5 3 4 4 10 15 43 37 7 0 0 0 0 0 1 2 3 2 2 2 1 7 6 13 15 24 40 41
9 1 19 21 17 22 17 10 7 4 0 0 0 5 4 6 6 4 1 0 0 5 10 4 1 2 2 2 2 1 2 6 6 6 6 6
6 1 21 37 50 52 56 58 45 23 2 0 0 1 25 78 77 69 18 0 2 40 26 15 12 10 12 18 9 11 4 4 8 8 7
35 1 13 28 42 46 56 59 58 36 8 0 0 1 34 68 85 86 17 0 0 3 12 52 42 40 26 36 45 22 3 2 1 43 43 42
49 4 17 10 14 21 27 30 31 28 15 0 2 13 26 36 45 30 7 0 8 14 10 8 3 7 46 59 5 0 31 42 66
9 1 16 15 15 14 12 11 12 15 10 0 0 4 15 15 15 16 16 17 5 14 9 0 1 1 2 8 51 43 37 33 5 28 28 18
0 0 7 8 9 10 9 8 7 8 4 0 1 0 5 14 17 22 24 20 12 5 1 3 20 27 34 30 33 18 0
1 1

SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA
JULY 1993
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

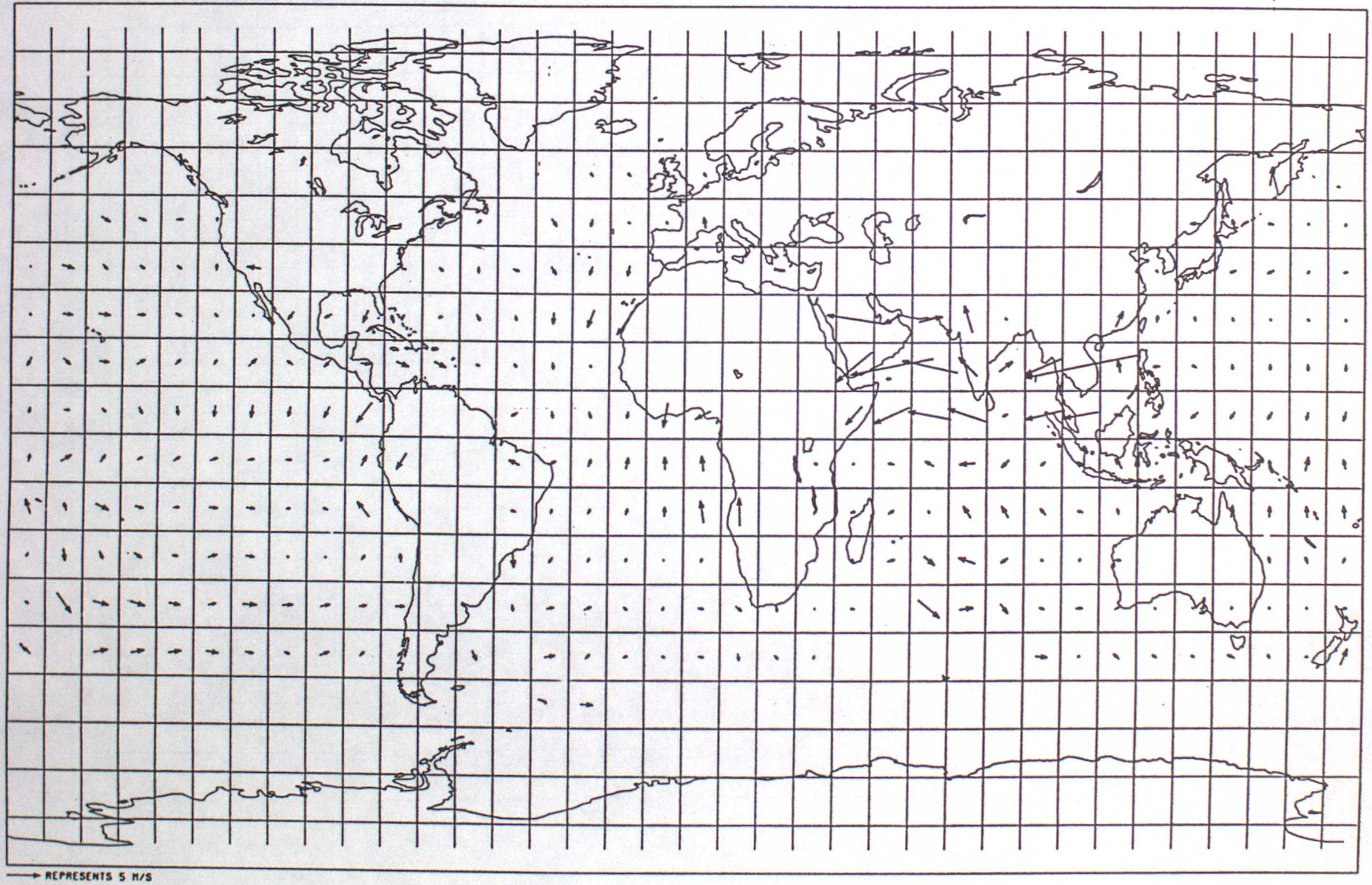
FIGURE 9


→ REPRESENTS 10 M/S

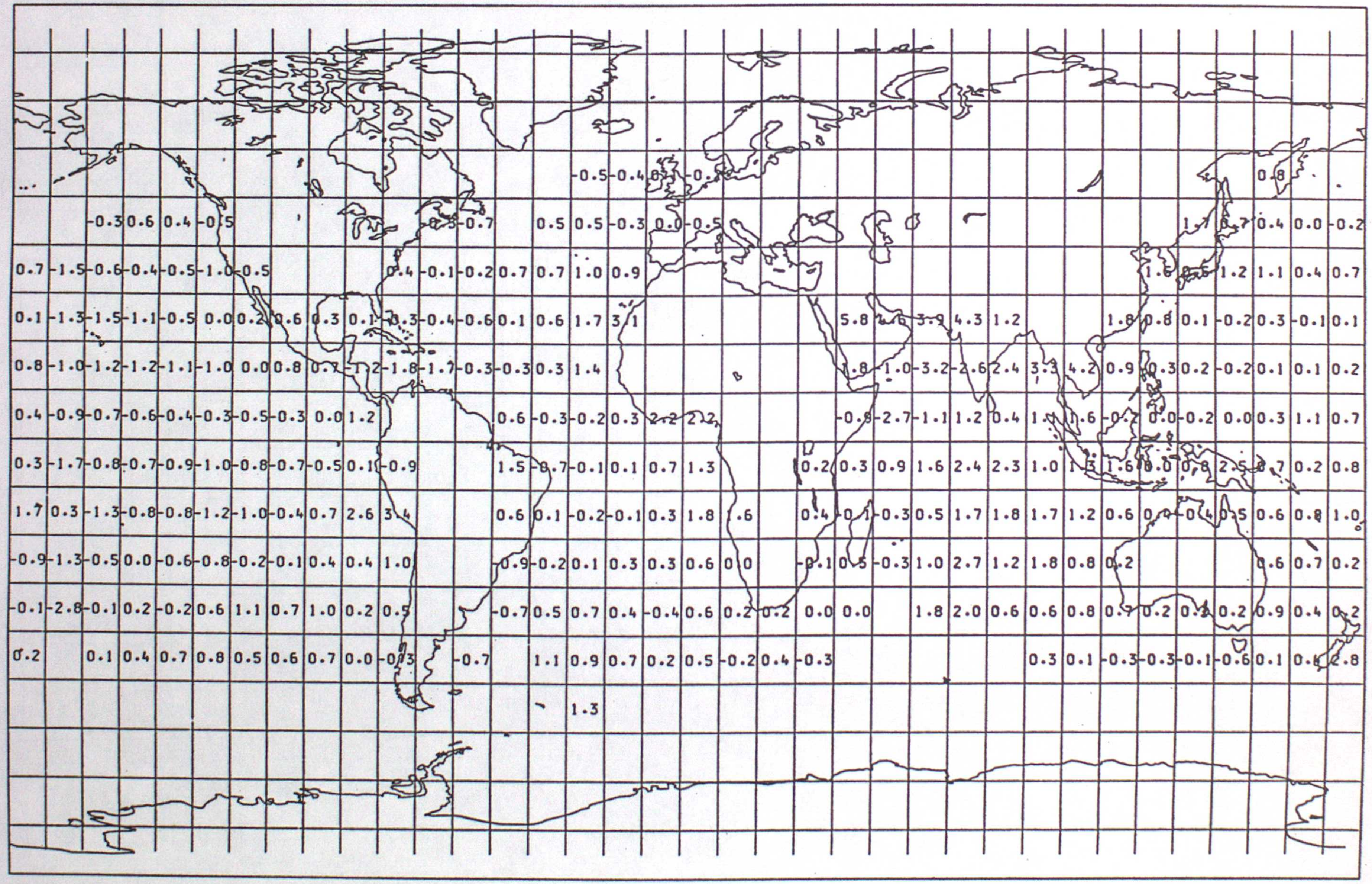
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

FIGURE 10

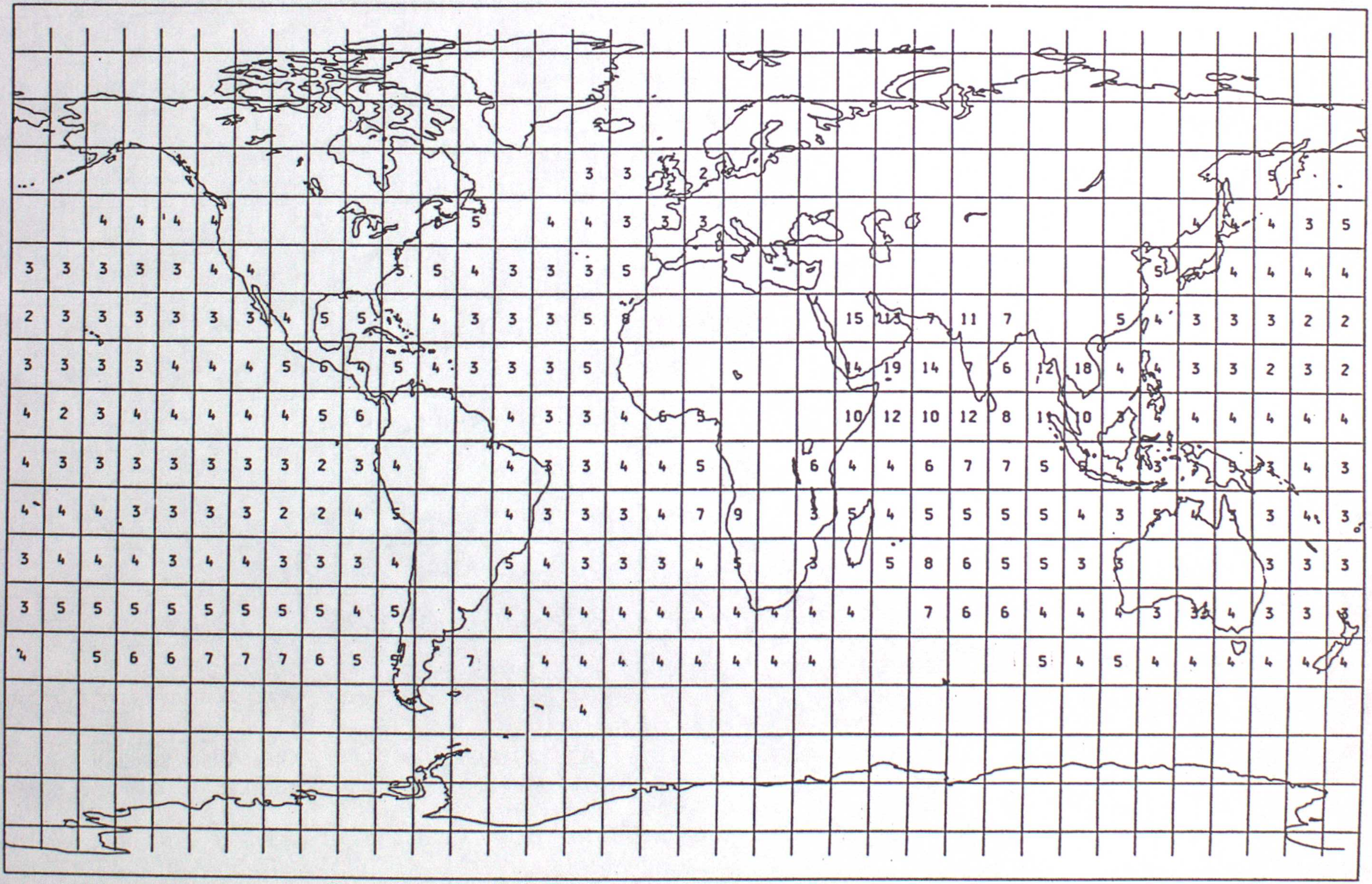
JULY 1993
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT


REPRESENTS 5 M/S

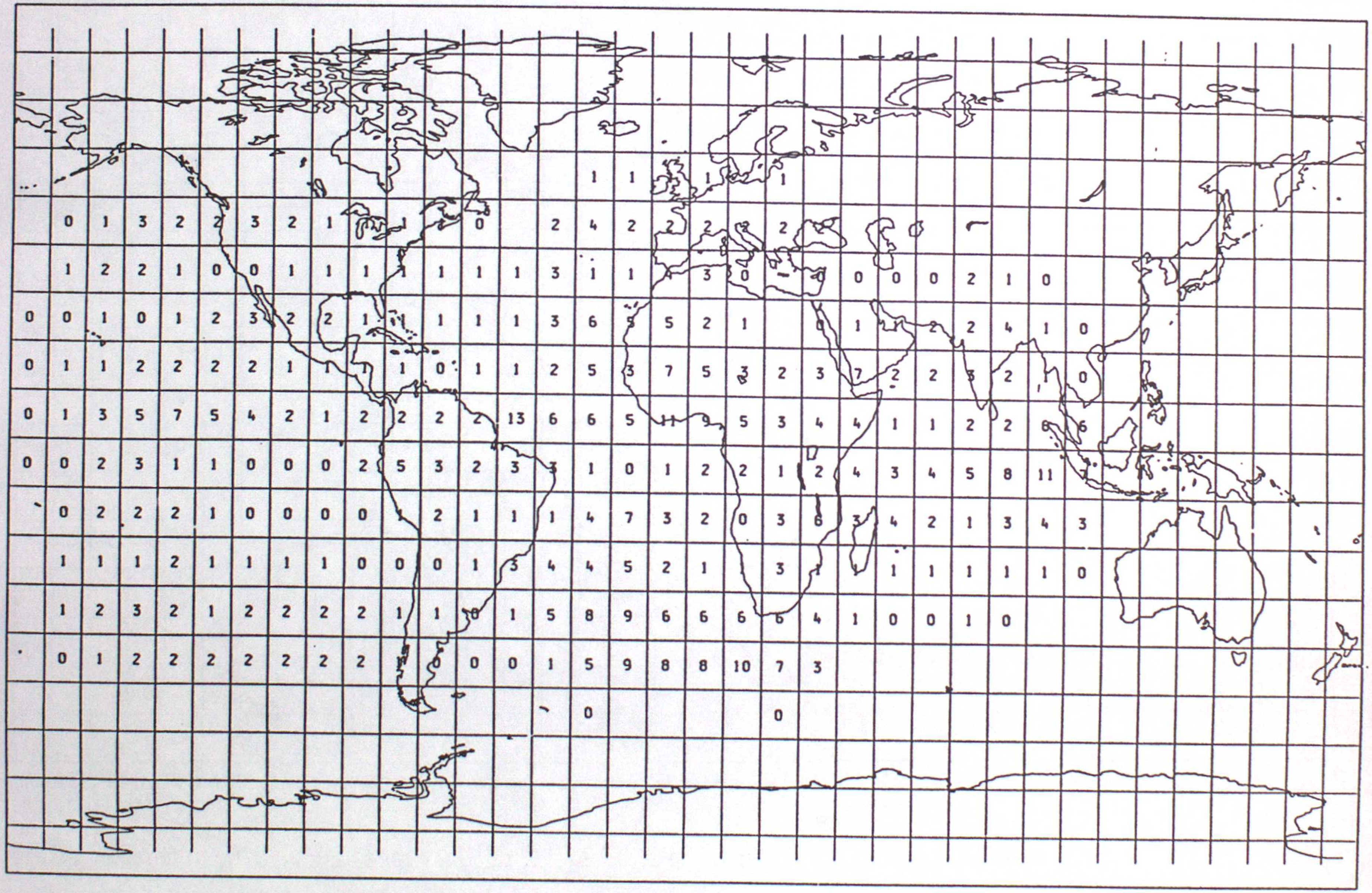
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 11
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-0.5 -0.4 0.8
-0.3 0.6 0.4 -0.5 -0.5 -0.7 0.5 0.5 -0.3 0.0 -0.5 1.7 0.7 0.4 0.0 -0.2
0.7 -1.5 -0.6 -0.4 -0.5 -1.0 -0.5 0.4 -0.1 -0.2 0.7 0.7 1.0 0.9 1.6 0.5 1.2 1.1 0.4 0.7
0.1 -1.3 -1.5 -1.1 -0.5 0.0 0.2 0.6 0.3 0.1 -0.3 -0.4 -0.6 0.1 0.6 1.7 3.1 5.8 2.6 3.9 4.3 1.2 1.8 0.8 0.1 -0.2 0.3 -0.1 0.1
0.8 -1.0 -1.2 -1.2 -1.1 -1.0 0.0 0.8 0.7 -1.2 -1.8 -1.7 -0.3 -0.3 0.3 1.4 1.8 -1.0 -3.2 -2.6 2.4 3.3 4.2 0.9 0.3 0.2 -0.2 0.1 0.1 0.2
0.4 -0.9 -0.7 -0.6 -0.4 -0.3 -0.5 -0.3 0.0 1.2 0.6 -0.3 -0.2 0.3 2.2 2.2 -0.8 -2.7 -1.1 1.2 0.4 1.1 1.6 -0.2 0.0 -0.2 0.0 0.3 1.1 0.7
0.3 -1.7 -0.8 -0.7 -0.9 -1.0 -0.8 -0.7 -0.5 0.1 -0.9 1.5 -0.7 -0.1 0.1 0.7 1.3 0.2 0.3 0.9 1.6 2.4 2.3 1.0 1.3 1.6 0.0 0.8 2.5 0.7 0.2 0.8
1.7 0.3 -1.3 -0.8 -0.8 -1.2 -1.0 -0.4 0.7 2.6 3.4 0.6 0.1 -0.2 -0.1 0.3 1.8 1.6 0.4 -0.1 -0.3 0.5 1.7 1.8 1.7 1.2 0.6 0.4 -0.4 0.5 0.6 0.8 1.0
-0.9 -1.3 -0.5 0.0 -0.6 -0.8 -0.2 -0.1 0.4 0.4 1.0 -0.9 -0.2 0.1 0.3 0.3 0.6 0.0 -0.1 0.5 -0.3 1.0 2.7 1.2 1.8 0.8 0.2 0.6 0.7 0.2
-0.1 -2.8 -0.1 0.2 -0.2 0.6 1.1 0.7 1.0 0.2 0.5 -0.7 0.5 0.7 0.4 -0.4 0.6 0.2 0.2 0.0 0.0 1.8 2.0 0.6 0.6 0.8 0.7 0.2 0.3 0.2 0.9 0.4 0.2
0.2 0.1 0.4 0.7 0.8 0.5 0.6 0.7 0.0 -0.3 -0.7 1.1 0.9 0.7 0.2 0.5 -0.2 0.4 -0.3 0.3 0.1 -0.3 -0.3 -0.1 -0.6 0.1 0.4 2.8
1.3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 12
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 13
JULY 1993


1 1 1 1 1
0 1 3 2 2 3 2 1 1 1 0 0 2 4 2 2 2 2 2
1 2 2 1 0 0 1 1 1 1 1 1 1 3 1 1 4 3 0 0 0 0 0 2 1 0
0 0 1 0 1 2 3 2 2 1 1 1 1 1 3 6 5 5 2 1 0 1 1 2 2 4 1 0
0 1 1 2 2 2 2 1 1 1 1 0 1 1 2 5 3 7 5 3 2 3 7 2 2 3 2 1 0
0 1 3 5 7 5 4 2 1 2 2 2 2 13 6 6 5 11 9 5 3 4 4 1 1 2 2 6 6
0 0 2 3 1 1 0 0 0 2 5 3 2 3 3 1 0 1 2 2 1 2 4 3 4 5 8 11 7
0 2 2 2 1 0 0 0 0 1 2 1 1 1 4 7 3 2 0 3 6 3 4 2 1 3 4 3
1 1 1 2 1 1 1 1 0 0 0 1 3 4 4 5 2 1 3 1 1 1 1 1 1 1 0
1 2 3 2 1 2 2 2 2 1 1 0 1 5 8 9 6 6 6 6 4 1 0 0 1 0
0 1 2 2 2 2 2 2 2 1 0 0 0 1 5 9 8 8 10 7 3
0 0

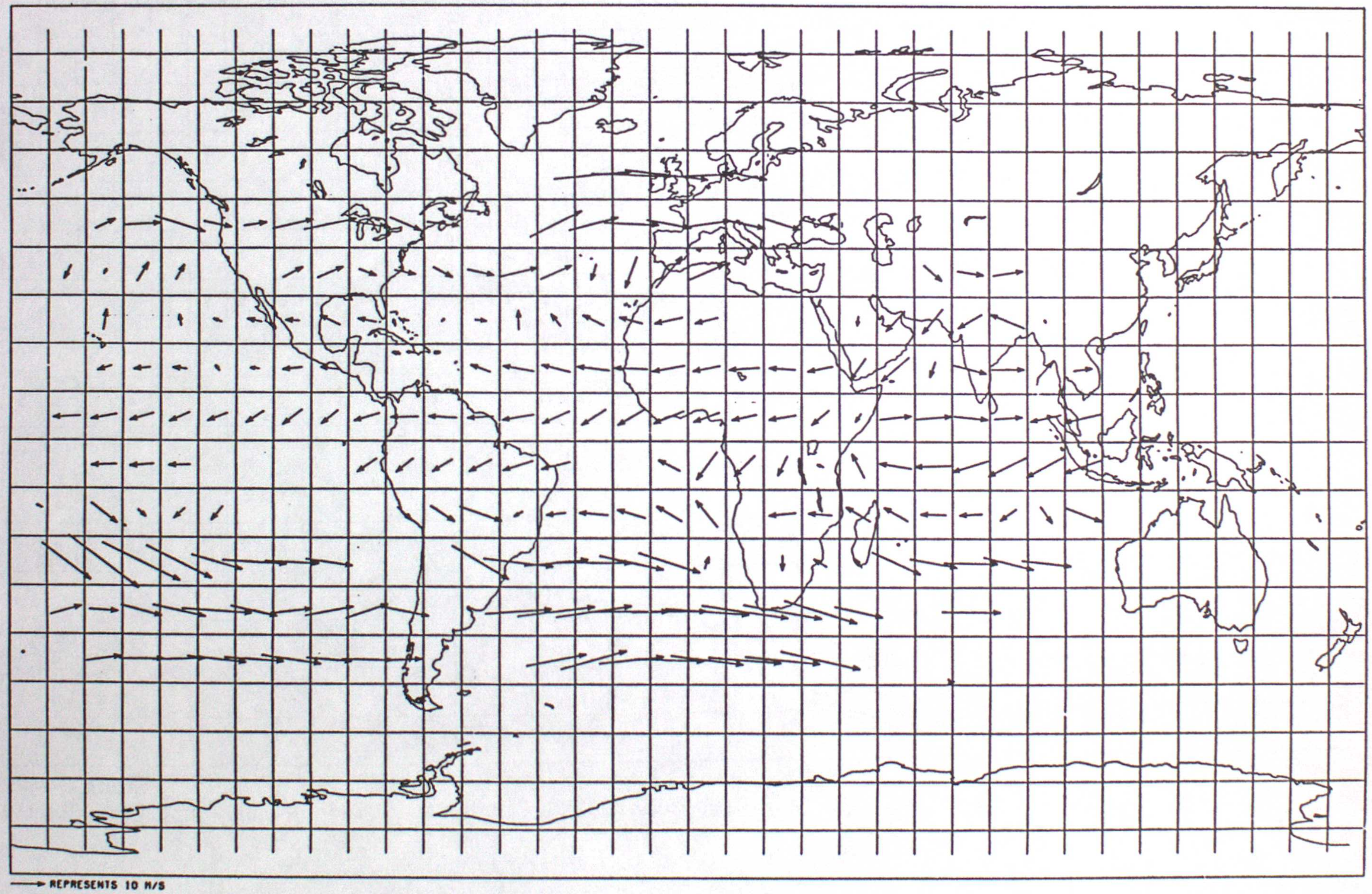
SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA

JULY 1993

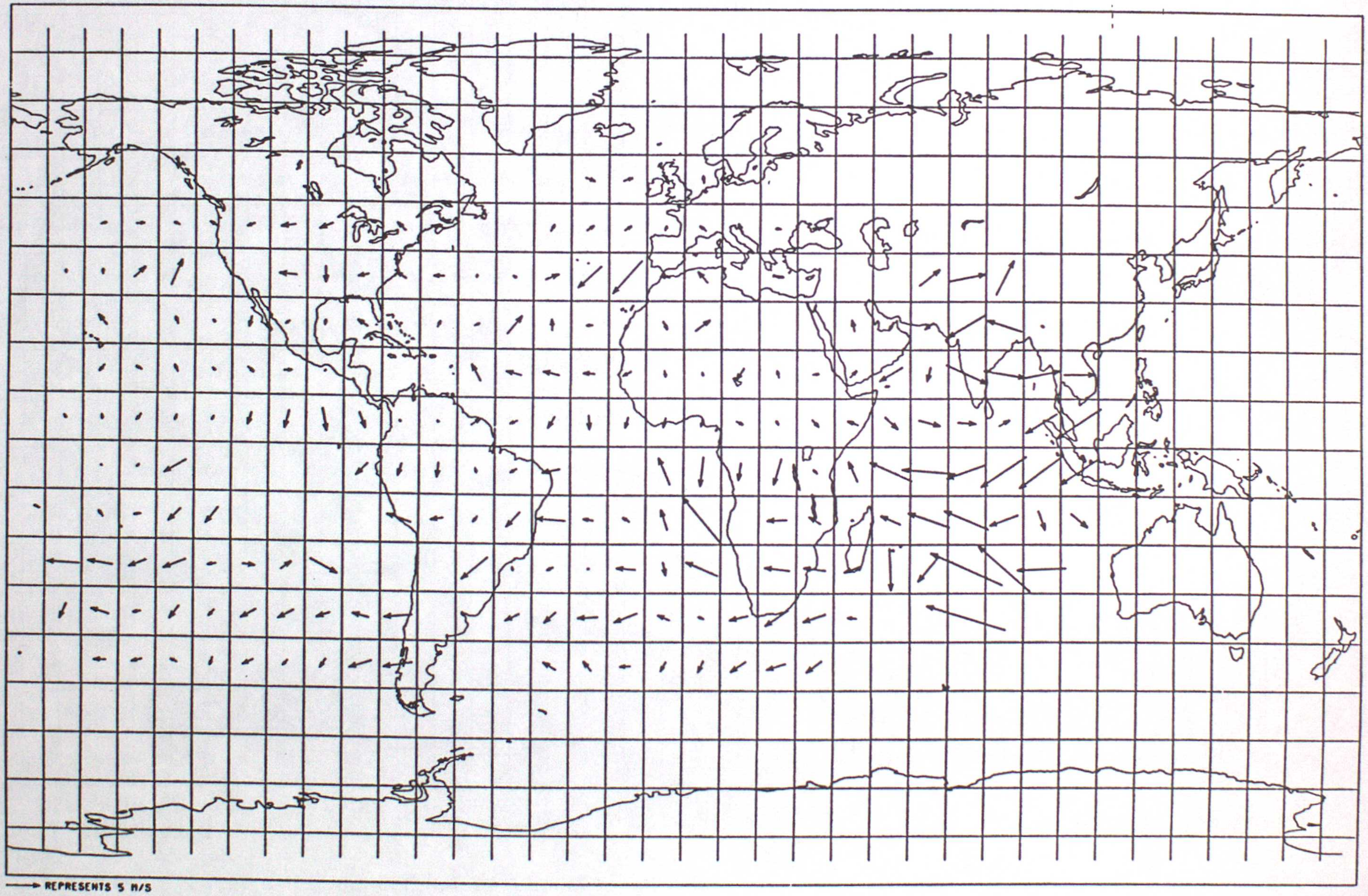
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

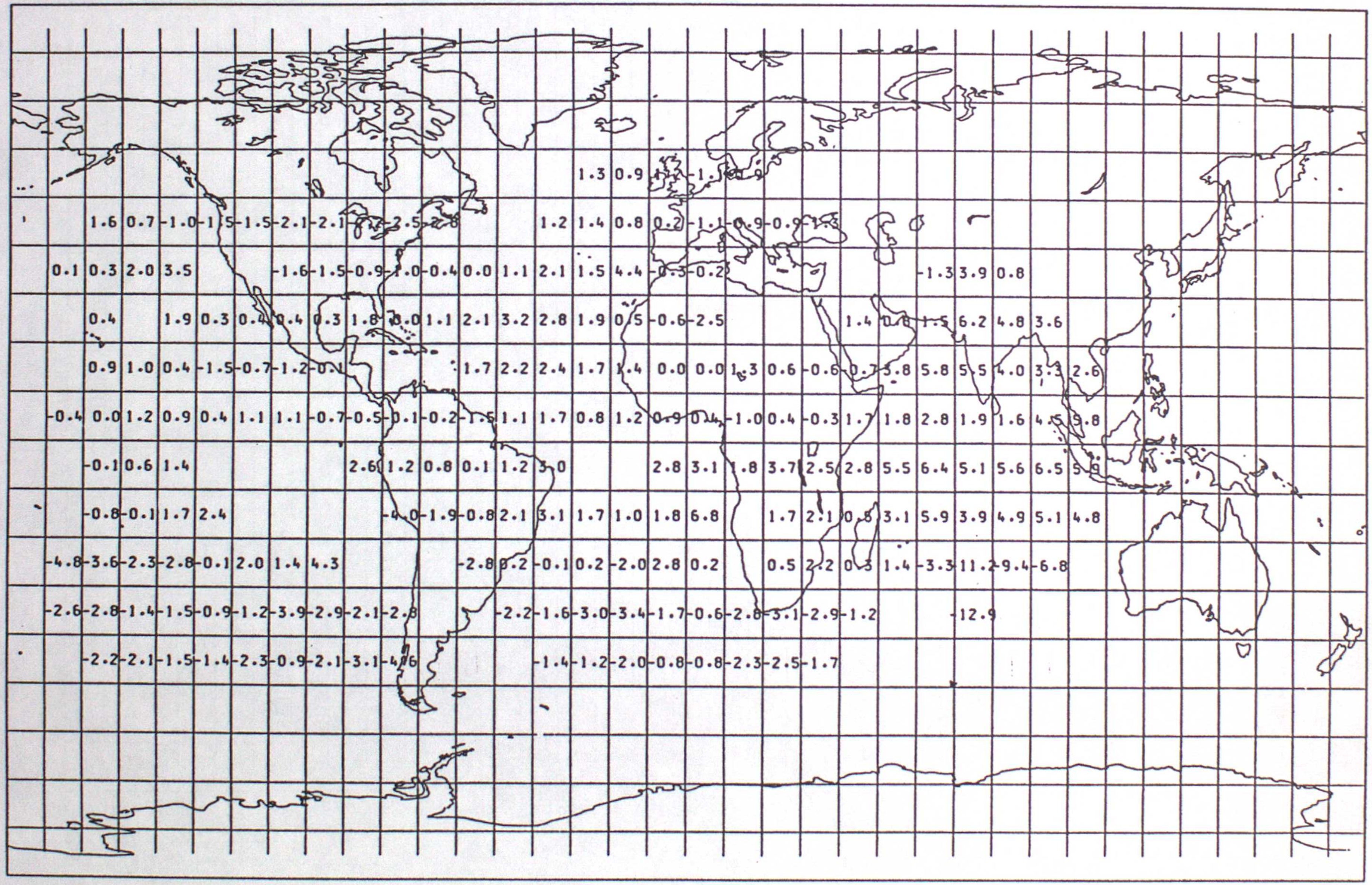
FIGURE 14


REPRESENTS 10 M/S

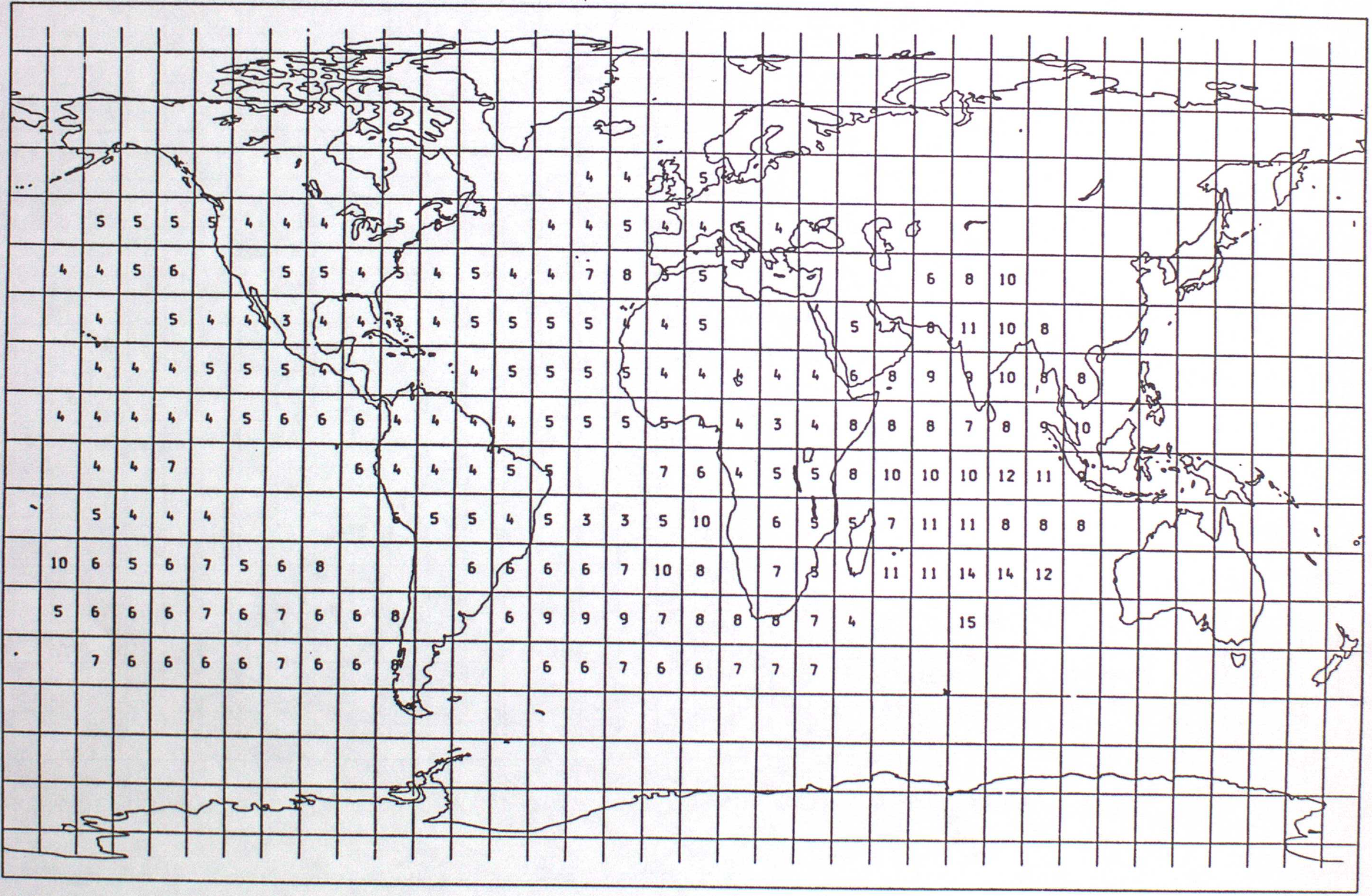
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA FIGURE 15
JULY 1993
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT


REPRESENTS 5 M/S

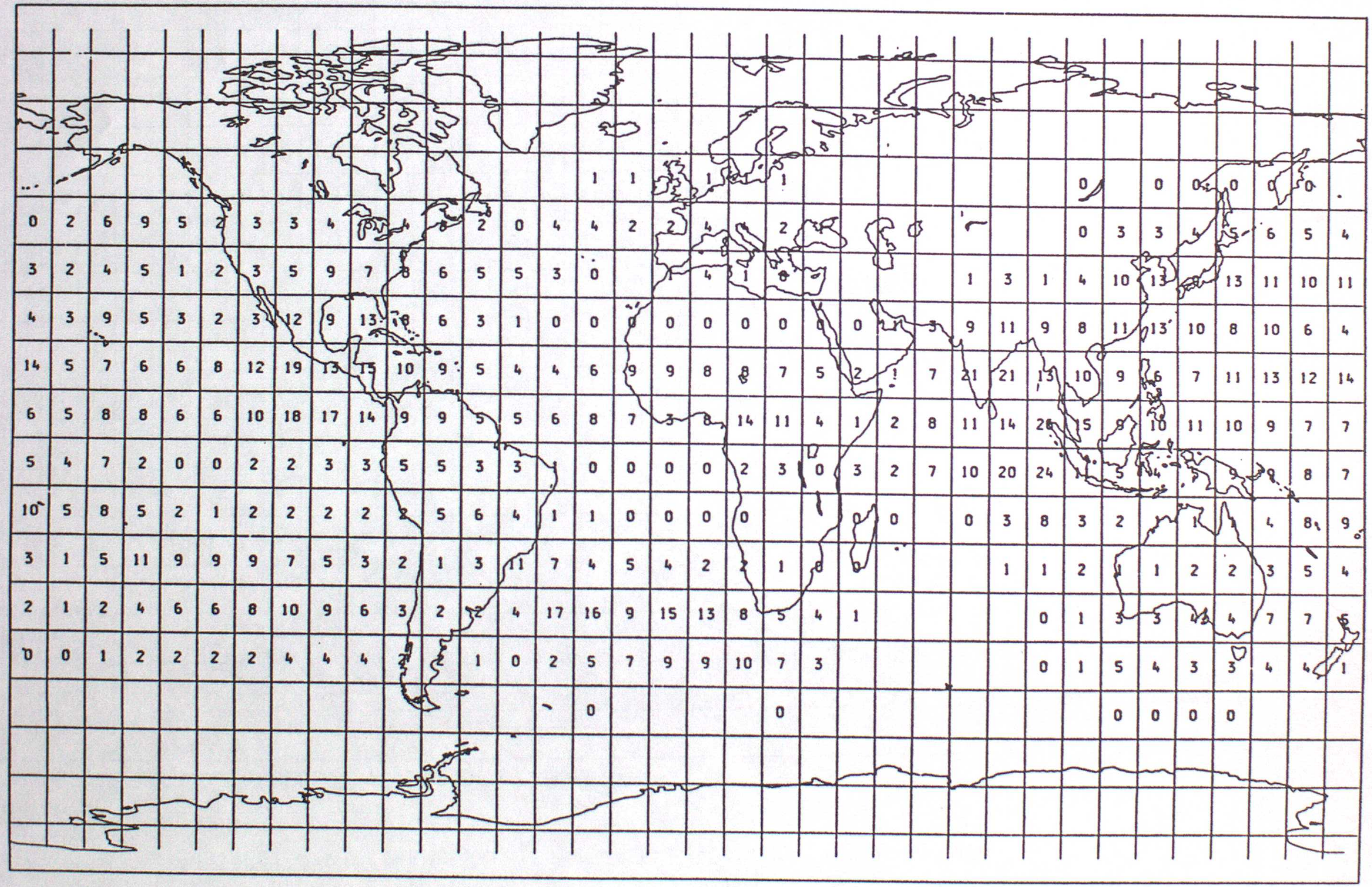
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 16
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


1.3 0.9 -1.1
1.6 0.7 -1.0 -1.5 -1.5 -2.1 -2.1 -2.2 -2.5 -2.8 1.2 1.4 0.8 0.2 -1.1 -0.9 -0.9 -1.3
0.1 0.3 2.0 3.5 -1.6 -1.5 -0.9 -1.0 -0.4 0.0 1.1 2.1 1.5 4.4 -0.3 -0.2 -1.3 3.9 0.8
0.4 1.9 0.3 0.4 0.4 0.3 1.8 0.0 1.1 2.1 3.2 2.8 1.9 0.5 -0.6 -2.5 1.4 0.8 1.5 6.2 4.8 3.6
0.9 1.0 0.4 -1.5 -0.7 -1.2 -0.1 1.7 2.2 2.4 1.7 1.4 0.0 0.0 1.3 0.6 -0.6 0.7 3.8 5.8 5.5 4.0 3.3 2.6
-0.4 0.0 1.2 0.9 0.4 1.1 1.1 -0.7 -0.5 0.1 -0.2 -1.5 1.1 1.7 0.8 1.2 0.9 0.4 -1.0 0.4 -0.3 1.7 1.8 2.8 1.9 1.6 4.5 3.8
-0.1 0.6 1.4 2.6 1.2 0.8 0.1 1.2 3.0 2.8 3.1 1.8 3.7 2.5 2.8 5.5 6.4 5.1 5.6 6.5 5.9
-0.8 -0.1 1.7 2.4 -4.0 -1.9 -0.8 2.1 3.1 1.7 1.0 1.8 6.8 1.7 2.1 0.8 3.1 5.9 3.9 4.9 5.1 4.8
-4.8 -3.6 -2.3 -2.8 -0.1 2.0 1.4 4.3 -2.8 0.2 -0.1 0.2 -2.0 2.8 0.2 0.5 2.2 0.3 1.4 -3.3 11.2 -9.4 -6.8
-2.6 -2.8 -1.4 -1.5 -0.9 -1.2 -3.9 -2.9 -2.1 -2.8 -2.2 -1.6 -3.0 -3.4 -1.7 -0.6 -2.8 -3.1 -2.9 -1.2 -12.9
-2.2 -2.1 -1.5 -1.4 -2.3 -0.9 -2.1 -3.1 -4.6 -1.4 -1.2 -2.0 -0.8 -0.8 -2.3 -2.5 -1.7

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 17
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


4 4 5
5 5 5 5 4 4 4 5 4 4 5 4 4 4
4 4 5 6 5 5 4 5 4 5 4 4 7 8 5 5 6 8 10
4 5 4 4 3 4 4 3 4 5 5 5 5 4 4 5 5 7 8 11 10 8
4 4 4 5 5 5 4 4 5 5 5 5 4 4 4 4 4 6 8 9 9 10 8 8
4 4 4 4 4 5 6 6 6 4 4 4 4 5 5 5 5 4 4 3 4 8 8 8 7 8 9 10
4 4 7 6 4 4 4 5 5 7 6 4 5 5 8 10 10 10 12 11 9
5 4 4 4 5 5 5 4 5 3 3 5 10 6 5 5 7 11 11 8 8 8
10 6 5 6 7 5 6 8 6 6 6 6 7 10 8 7 5 4 11 11 14 14 12
5 6 6 6 7 6 7 6 6 8 6 9 9 9 7 8 8 8 7 4 15
7 6 6 6 6 7 6 6 8 6 6 7 6 6 7 7 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 18
JULY 1993



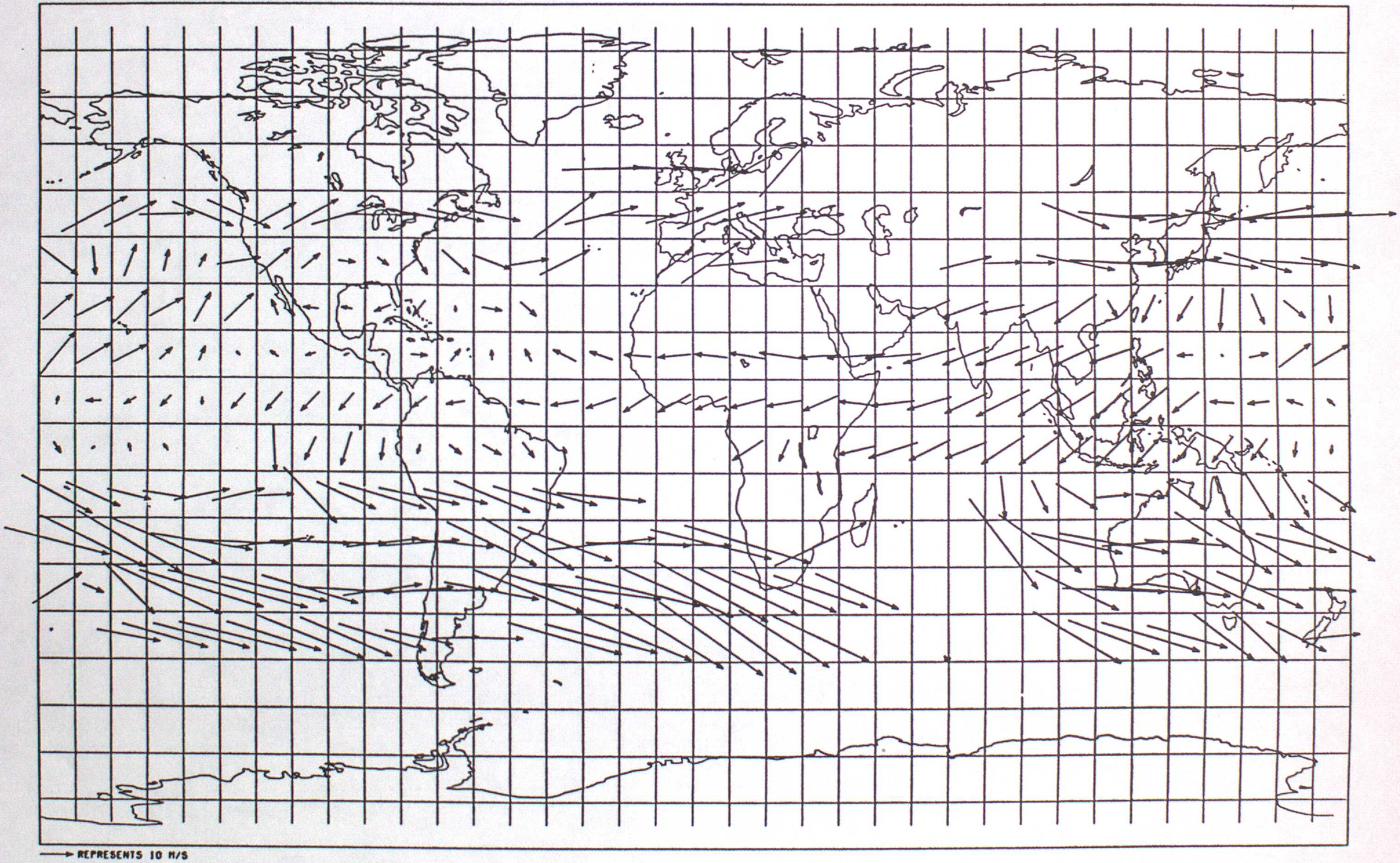
SATOB VECTOR MEAN WINDS BETWEEN 101-400 HPA

JULY 1993

ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 19


REPRESENTS 10 M/S

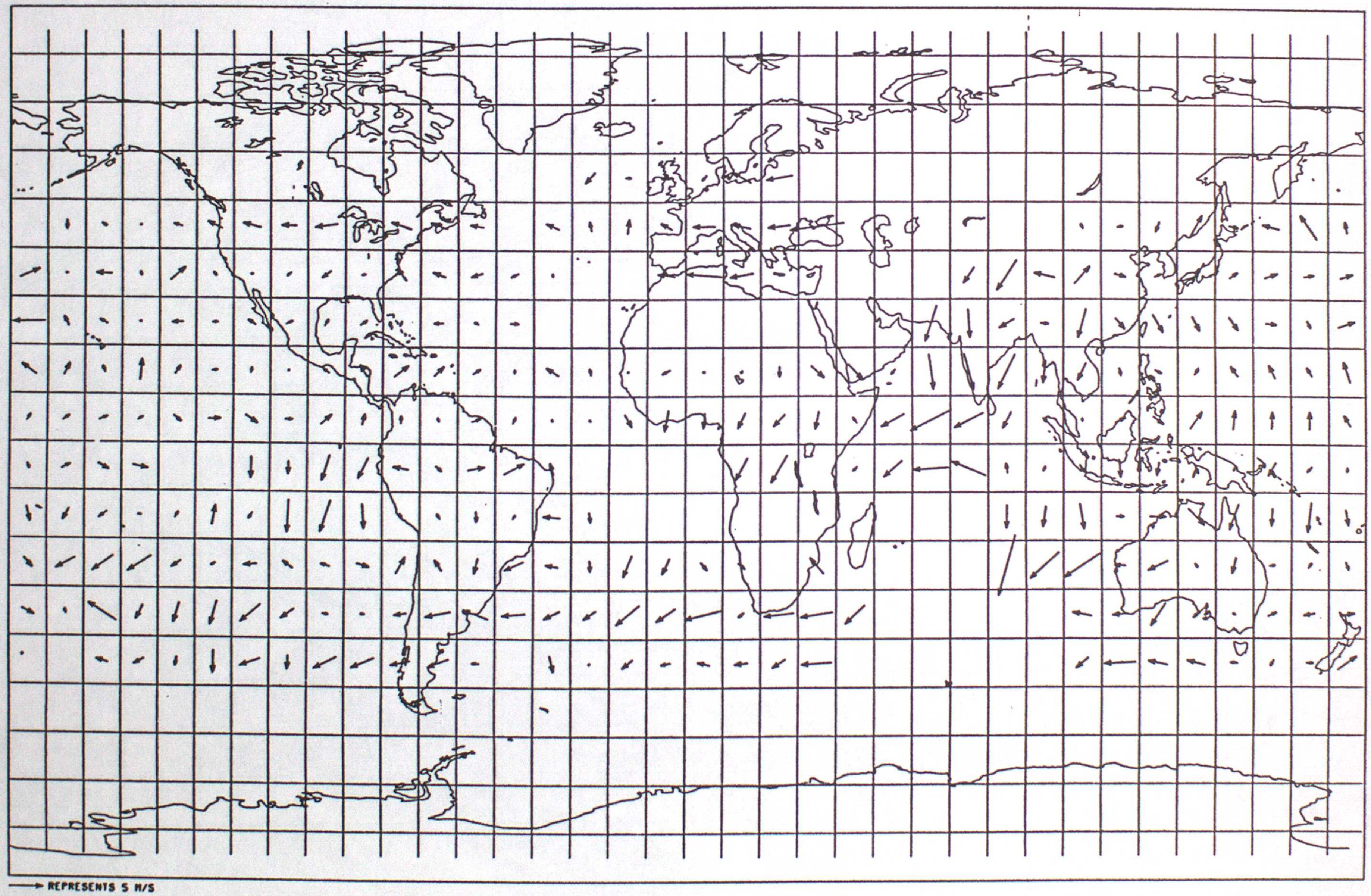
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

JULY 1993

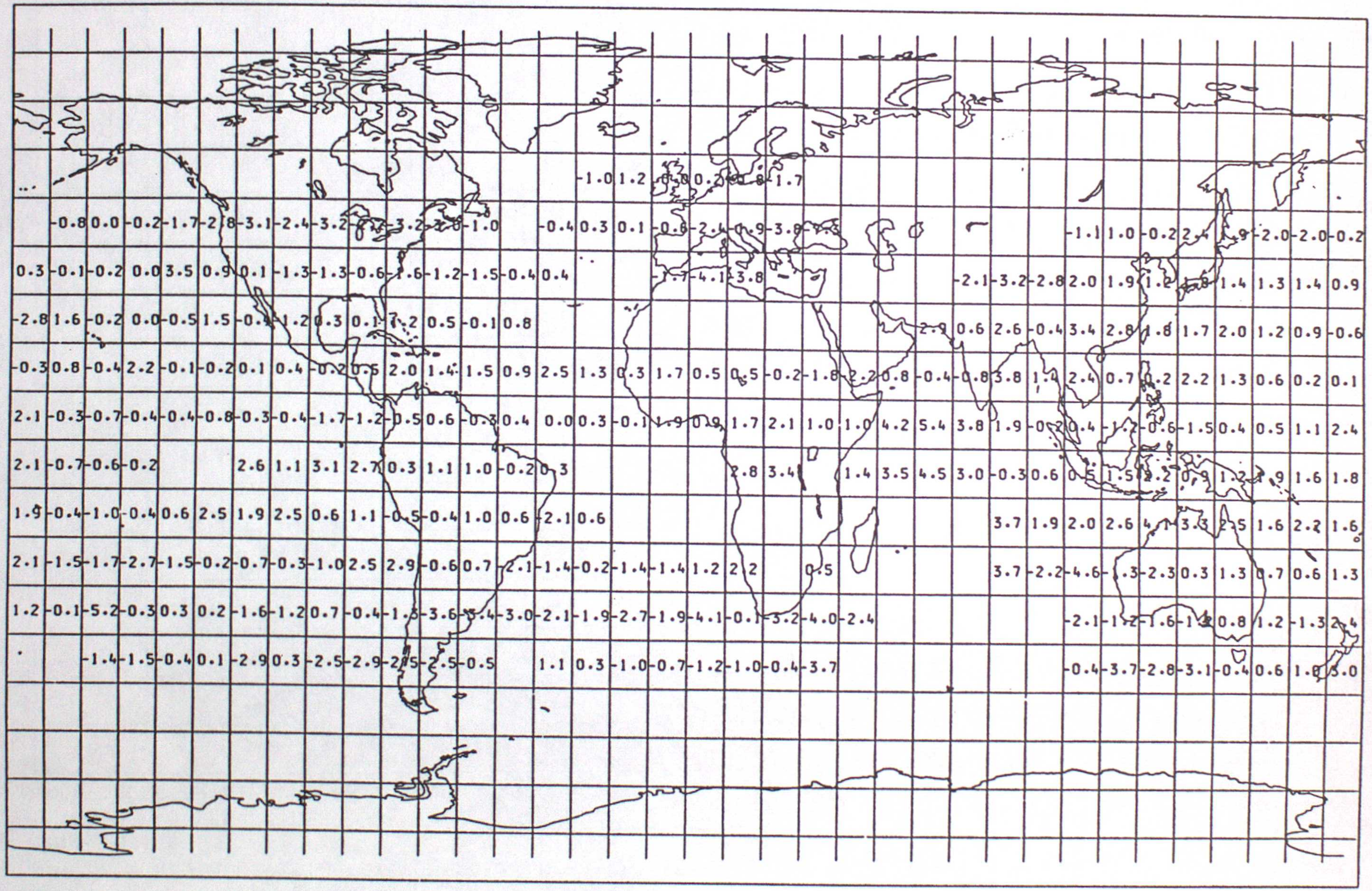
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

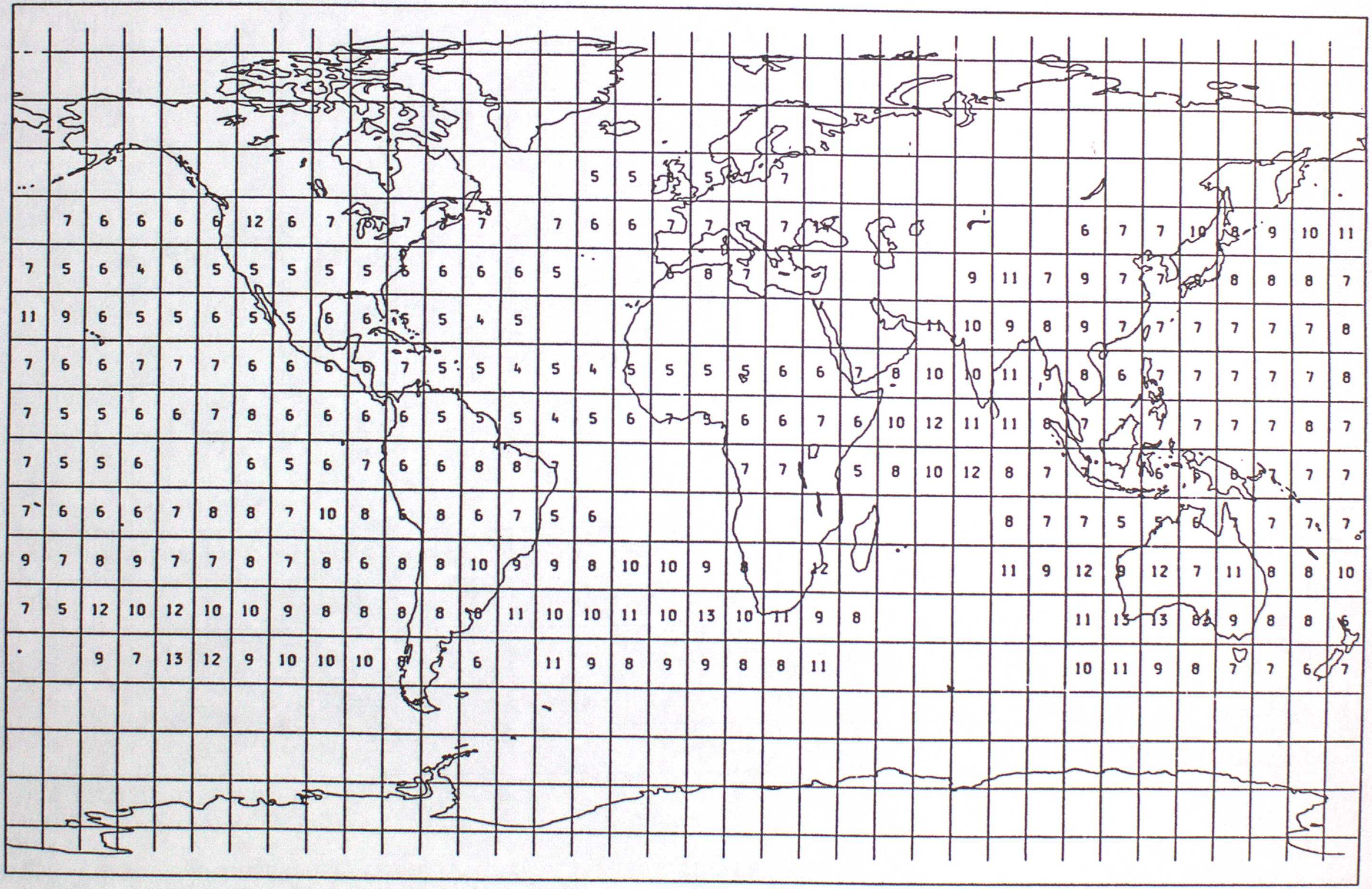
FIGURE 20


→ REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 21
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-1.0 1.2 0.0 0.2 -0.8 -1.7
-0.8 0.0 -0.2 -1.7 -2.8 -3.1 -2.4 -3.2 -2.2 -3.2 -2.0 -1.0 -0.4 0.3 0.1 -0.6 -2.4 -0.9 -3.8 -1.3 -1.1 1.0 -0.2 2.4 1.9 -2.0 -2.0 -0.2
0.3 -0.1 -0.2 0.0 3.5 0.9 0.1 -1.3 -1.3 -0.6 -1.6 -1.2 -1.5 -0.4 0.4 -1.7 -4.1 -3.8 -2.1 -3.2 -2.8 2.0 1.9 1.2 1.8 1.4 1.3 1.4 0.9
-2.8 1.6 -0.2 0.0 -0.5 1.5 -0.4 -1.2 0.3 0.1 1.2 0.5 -0.1 0.8 2.9 0.6 2.6 -0.4 3.4 2.8 1.8 1.7 2.0 1.2 0.9 -0.6
-0.3 0.8 -0.4 2.2 -0.1 -0.2 0.1 0.4 -0.2 0.5 2.0 1.4 1.5 0.9 2.5 1.3 0.3 1.7 0.5 0.5 -0.2 -1.8 2.2 0.8 -0.4 -0.8 3.8 1.4 2.4 0.7 0.2 2.2 1.3 0.6 0.2 0.1
2.1 -0.3 -0.7 -0.4 -0.4 -0.8 -0.3 -0.4 -1.7 -1.2 0.5 0.6 -0.3 0.4 0.0 0.3 -0.1 1.9 0.9 1.7 2.1 1.0 1.0 4.2 5.4 3.8 1.9 -0.2 0.4 -1.2 -0.6 -1.5 0.4 0.5 1.1 2.4
2.1 -0.7 -0.6 -0.2 2.6 1.1 3.1 2.7 0.3 1.1 1.0 -0.2 0.3 2.8 3.4 1.4 3.5 4.5 3.0 -0.3 0.6 0.5 1.5 2.2 0.9 1.2 1.9 1.6 1.8
1.9 -0.4 -1.0 -0.4 0.6 2.5 1.9 2.5 0.6 1.1 -0.5 -0.4 1.0 0.6 2.1 0.6 3.7 1.9 2.0 2.6 4.1 3.3 2.5 1.6 2.2 1.6
2.1 -1.5 -1.7 -2.7 -1.5 -0.2 -0.7 -0.3 -1.0 2.5 2.9 -0.6 0.7 2.1 -1.4 -0.2 -1.4 -1.4 1.2 2.2 0.5 3.7 -2.2 -4.6 1.3 -2.3 0.3 1.3 0.7 0.6 1.3
1.2 -0.1 -5.2 -0.3 0.3 0.2 -1.6 -1.2 0.7 -0.4 -1.3 -3.6 -3.4 -3.0 -2.1 -1.9 -2.7 -1.9 -4.1 -0.1 -3.2 -4.0 -2.4 -2.1 -1.2 -1.6 -1.2 0.8 1.2 -1.3 2.4
-1.4 -1.5 -0.4 0.1 -2.9 0.3 -2.5 -2.9 -2.5 -2.5 -0.5 1.1 0.3 -1.0 -0.7 -1.2 -1.0 -0.4 -3.7 -0.4 -3.7 -2.8 -3.1 -0.4 0.6 1.8 3.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 22
JULY 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


5 5 5 5 7
7 6 6 6 6 12 6 7 7 7 7 7 6 6 7 7 7 7 6 7 7 10 8 9 10 11
7 5 6 4 6 5 5 5 5 5 6 6 6 6 5 6 8 7 9 11 7 9 7 7 8 8 8 7
11 9 6 5 5 6 5 5 6 6 5 5 4 5 11 10 9 8 9 7 7 7 7 7 7 8
7 6 6 7 7 7 6 6 6 6 7 5 5 4 5 4 5 5 5 5 6 6 7 8 10 10 11 9 8 6 7 7 7 7 7 8
7 5 5 6 6 7 8 6 6 6 6 5 5 5 4 5 6 7 5 6 6 7 6 10 12 11 11 8 7 7 7 7 7 7 8 7
7 5 5 6 6 5 6 7 6 6 8 8 7 7 7 5 8 10 12 8 7 7 7 6 8 7 7 7
7 6 6 6 7 8 8 7 10 8 6 8 6 7 5 6 8 7 7 5 5 6 7 7 7 7
9 7 8 9 7 7 8 7 8 6 8 8 10 9 9 8 10 10 9 8 12 11 9 12 9 12 7 11 8 8 10
7 5 12 10 12 10 10 9 8 8 8 8 8 11 10 10 11 10 13 10 11 9 8 11 13 13 8 9 8 8 6
9 7 13 12 9 10 10 10 8 7 6 11 9 8 9 9 8 8 11 10 11 9 8 7 7 6 7

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: July, 93

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-12 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa
	:Mean observation minus background temperature differences

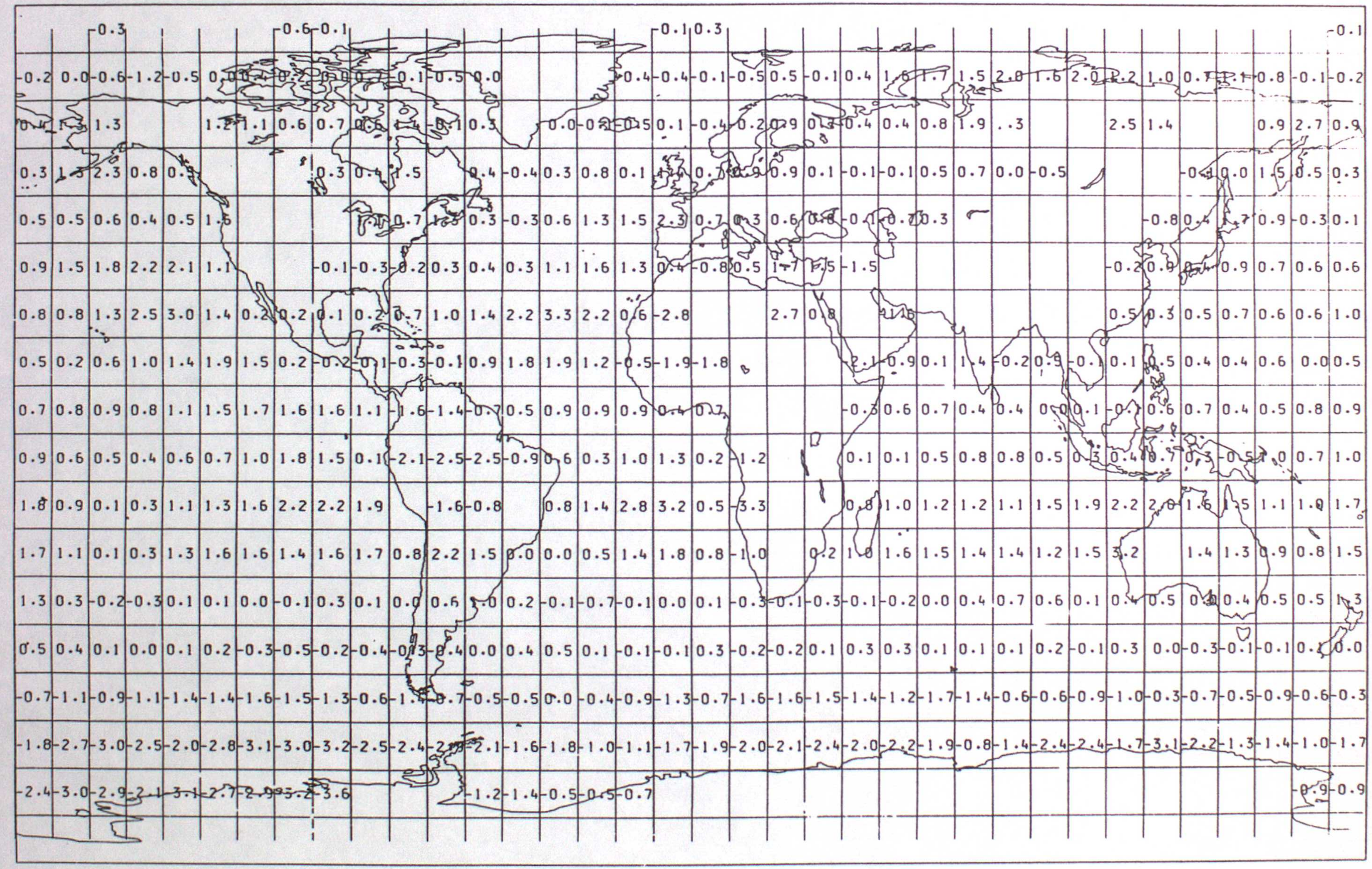
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA

JULY 1993

FIGURE 23

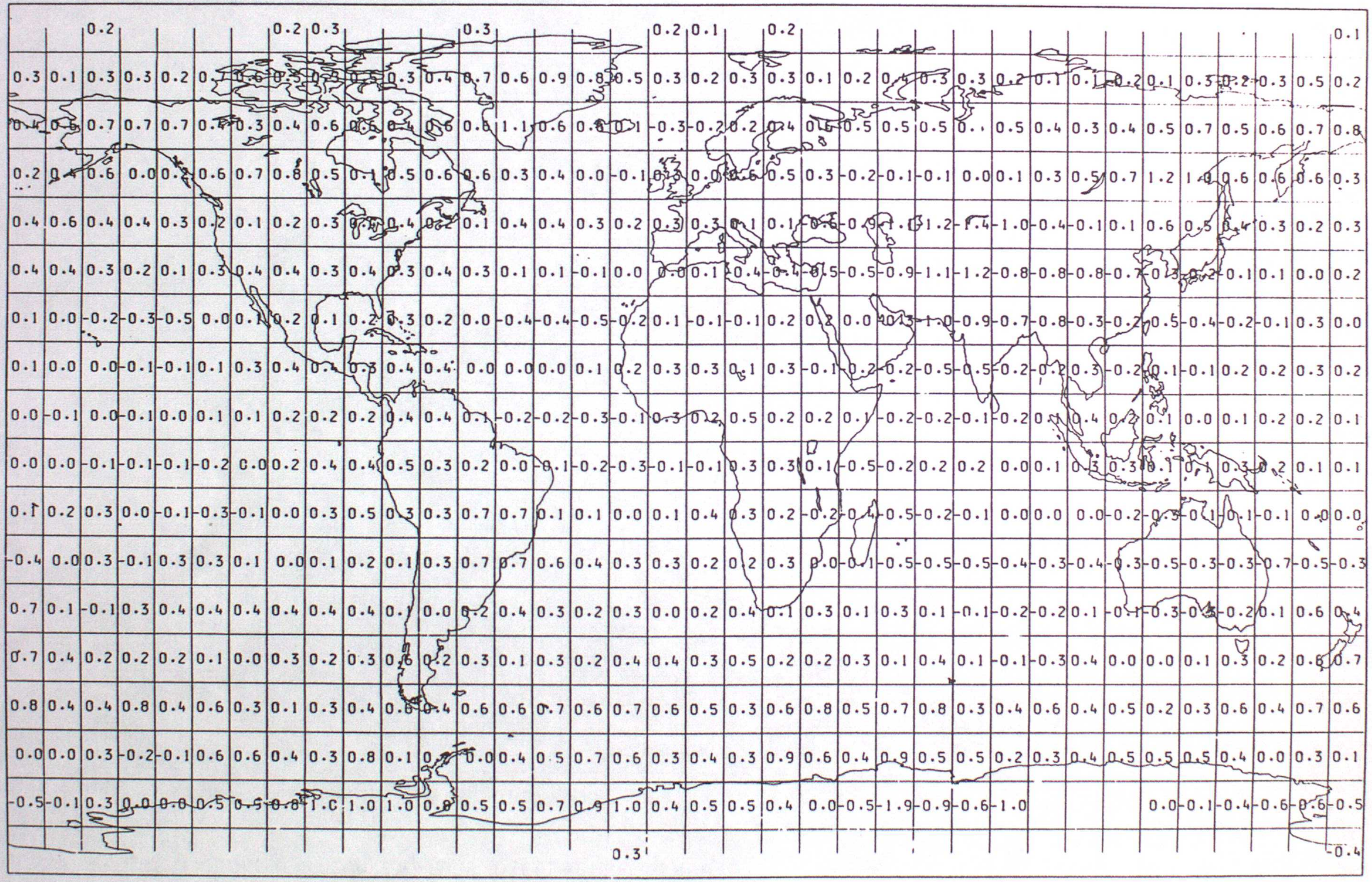
NOAA-11. USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

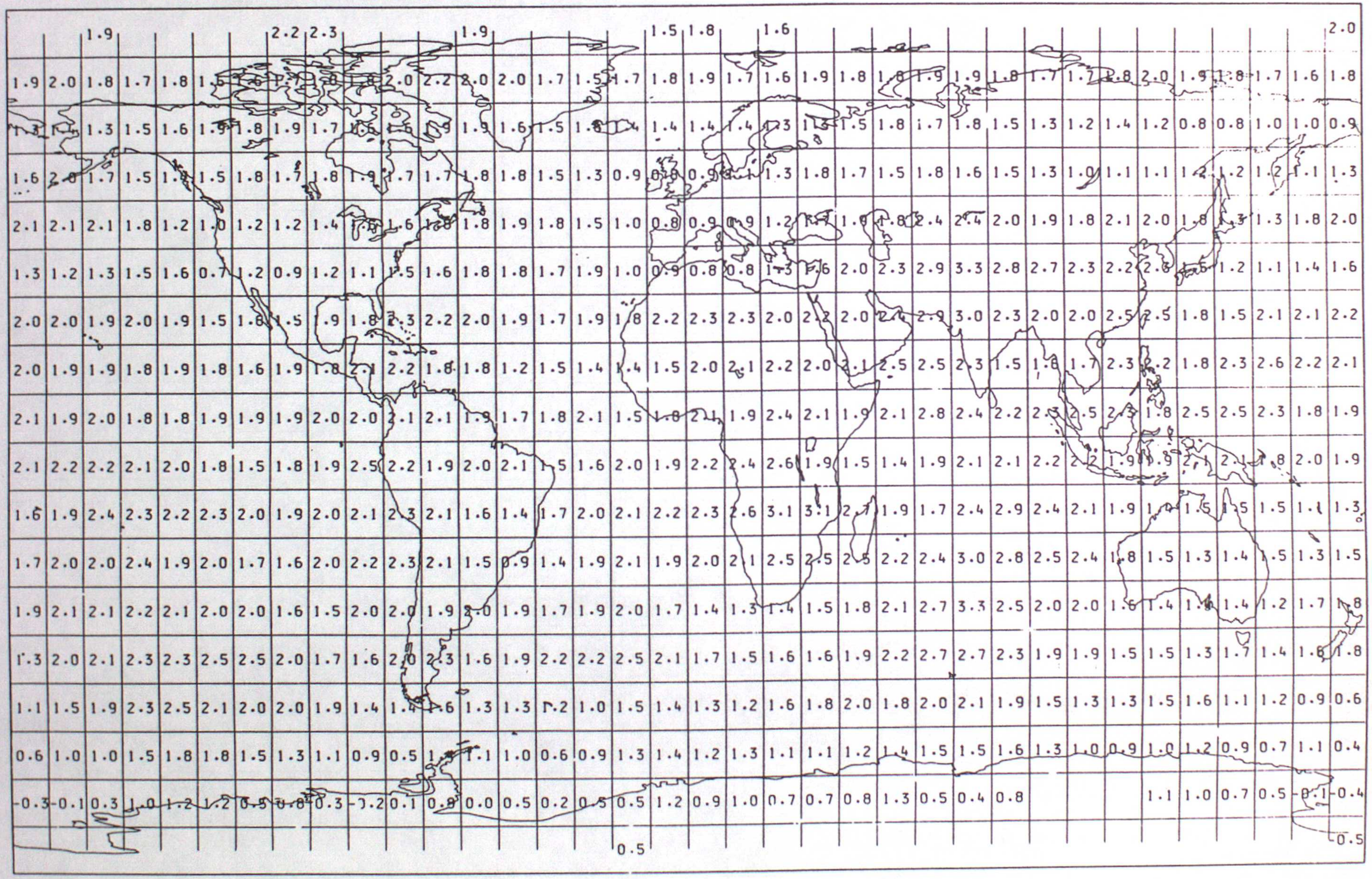

-0.3 -0.6 -0.1 -0.1 0.3 -0.1
-0.2 0.0 -0.6 -1.2 -0.5 -0.1 -0.5 0.0 -0.4 -0.4 -0.1 -0.5 0.5 -0.1 0.4 1.7 1.5 2.0 1.6 2.0 1.0 -0.8 -0.1 -0.2
1.3 1.1 0.6 0.7 0.3 0.0 0.1 -0.4 -0.2 -0.4 0.4 0.8 1.9 .3 2.5 1.4 0.9 2.7 0.9
0.3 2.3 0.8 0.3 1.5 0.4 -0.4 0.3 0.8 0.1 0.9 0.1 -0.1 -0.1 0.5 0.7 0.0 -0.5 0.0 1.5 0.5 0.3
0.5 0.5 0.6 0.4 0.5 0.7 0.3 -0.3 0.6 1.3 1.5 2.3 0.7 0.6 0.3 -0.8 0.9 -0.3 0.1
0.9 1.5 1.8 2.2 2.1 1.1 -0.1 -0.3 0.2 0.3 0.4 0.3 1.1 1.6 1.3 -0.8 0.5 1.5 -1.5 -0.2 -0.9 0.7 0.6 0.6
0.8 0.8 1.3 2.5 3.0 1.4 0.2 0.2 0.1 0.2 0.7 1.0 1.4 2.2 3.3 2.2 -2.8 2.7 0.5 0.3 0.5 0.7 0.6 0.6 1.0
0.5 0.2 0.6 1.0 1.4 1.9 1.5 0.2 -0.3 -0.1 0.9 1.8 1.9 1.2 -0.5 -1.9 -1.8 -0.9 0.1 1.4 -0.2 0.1 0.5 0.4 0.4 0.6 0.0 0.5
0.7 0.8 0.9 0.8 1.1 1.5 1.7 1.6 1.6 1.1 -1.6 -1.4 -0.7 0.5 0.9 0.9 0.9 0.6 0.7 0.4 0.4 0.6 0.7 0.4 0.5 0.8 0.9
0.9 0.6 0.5 0.4 0.6 0.7 1.0 1.8 1.5 0.1 -2.1 -2.5 -2.5 -0.9 0.6 0.3 1.0 1.3 0.2 1.2 0.1 0.1 0.5 0.8 0.8 0.5 0.7 1.0
1.8 0.9 0.1 0.3 1.1 1.3 1.6 2.2 2.2 1.9 -1.6 -0.8 0.8 1.4 2.8 3.2 0.5 -3.3 1.0 1.2 1.2 1.1 1.5 1.9 2.2 1.1 1.7
1.7 1.1 0.1 0.3 1.3 1.6 1.6 1.4 1.6 1.7 0.8 2.2 1.5 0.0 0.0 0.5 1.4 1.8 0.8 -1.0 1.6 1.5 1.4 1.4 1.2 1.5 3.2 1.4 1.3 0.9 0.8 1.5
1.3 0.3 -0.2 -0.3 0.1 0.1 0.0 -0.1 0.3 0.1 0.6 0.2 -0.1 -0.7 -0.1 0.0 0.1 -0.3 -0.1 -0.3 -0.1 -0.2 0.0 0.4 0.7 0.6 0.1 0.5 0.4 0.5 0.5
0.5 0.4 0.1 0.0 0.1 0.2 -0.3 -0.5 -0.2 -0.4 0.0 0.4 0.5 0.1 -0.1 -0.1 0.3 -0.2 -0.2 0.1 0.3 0.3 0.1 0.1 0.1 0.2 -0.1 0.3 0.0 -0.3 -0.1 -0.1 0.0
-0.7 -1.1 -0.9 -1.1 -1.4 -1.4 -1.6 -1.5 -1.3 -0.6 -0.7 -0.5 -0.5 0.0 -0.4 -0.9 -1.3 -0.7 -1.6 -1.6 -1.5 -1.4 -1.2 -1.7 -1.4 -0.6 -0.6 -0.9 -1.0 -0.3 -0.7 -0.5 -0.9 -0.6 -0.3
-1.8 -2.7 -3.0 -2.5 -2.0 -2.8 -3.1 -3.0 -3.2 -2.5 -2.4 -2.1 -1.6 -1.8 -1.0 -1.1 -1.7 -1.9 -2.0 -2.1 -2.4 -2.0 -2.2 -1.9 -0.8 -1.4 -2.4 -2.4 -1.7 -3.1 -2.2 -1.3 -1.4 -1.0 -1.7
-2.4 -3.0 -2.9 -3.6 -1.2 -1.4 -0.5 -0.5 -0.7 -0.9 -0.9

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
JULY 1993
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 24

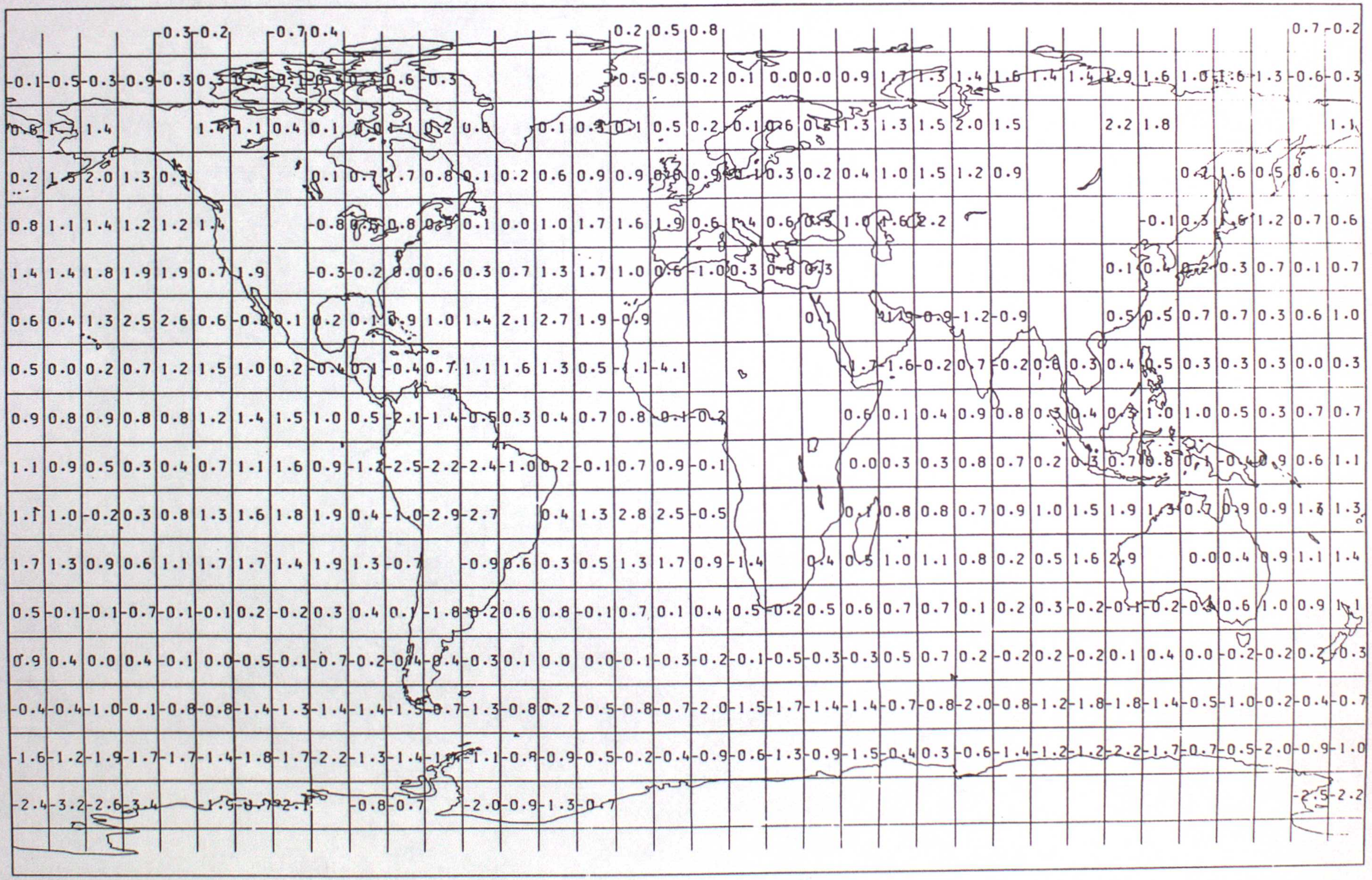


500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
FIGURE 25
JULY 1993
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.9 2.2 2.3 1.9 1.5 1.8 1.6 2.0
1.9 2.0 1.8 1.7 1.8 1.5 1.6 1.7 1.8 1.8 2.0 2.2 2.0 2.0 1.7 1.5 1.7 1.8 1.9 1.7 1.6 1.9 1.8 1.8 1.9 1.9 1.8 1.7 1.7 1.8 2.0 1.9 1.8 1.7 1.6 1.8
1.3 1.4 1.3 1.5 1.6 1.9 1.8 1.9 1.7 1.6 1.6 1.9 1.9 1.6 1.5 1.8 1.4 1.4 1.4 1.4 1.3 1.3 1.5 1.8 1.7 1.8 1.5 1.3 1.2 1.4 1.2 0.8 0.8 1.0 1.0 0.9
1.6 2.0 1.7 1.5 1.8 1.5 1.8 1.7 1.8 1.9 1.7 1.7 1.8 1.8 1.5 1.3 0.9 0.8 0.9 1.1 1.3 1.8 1.7 1.5 1.8 1.6 1.5 1.3 1.0 1.1 1.1 1.2 1.2 1.2 1.1 1.3
2.1 2.1 2.1 1.8 1.2 1.0 1.2 1.2 1.4 1.6 1.6 1.8 1.8 1.9 1.8 1.5 1.0 0.8 0.9 0.9 1.2 1.7 1.9 1.8 2.4 2.4 2.0 1.9 1.8 2.1 2.0 1.8 1.3 1.3 1.8 2.0
1.3 1.2 1.3 1.5 1.6 0.7 1.2 0.9 1.2 1.1 1.5 1.6 1.8 1.8 1.7 1.9 1.0 0.9 0.8 0.8 1.3 1.6 2.0 2.3 2.9 3.3 2.8 2.7 2.3 2.2 2.6 1.5 1.2 1.1 1.4 1.6
2.0 2.0 1.9 2.0 1.9 1.5 1.8 1.5 1.9 1.8 2.3 2.2 2.0 1.9 1.7 1.9 1.8 2.2 2.3 2.3 2.0 2.2 2.0 2.4 2.9 3.0 2.3 2.0 2.0 2.5 2.5 1.8 1.5 2.1 2.1 2.2
2.0 1.9 1.9 1.8 1.9 1.8 1.6 1.9 1.8 2.1 2.2 1.8 1.8 1.2 1.5 1.4 1.4 1.5 2.0 2.1 2.2 2.0 2.1 2.5 2.5 2.3 1.5 1.8 1.7 2.3 2.2 1.8 2.3 2.6 2.2 2.1
2.1 1.9 2.0 1.8 1.8 1.9 1.9 1.9 2.0 2.0 2.1 2.1 1.9 1.7 1.8 2.1 1.5 1.8 2.1 1.9 2.4 2.1 1.9 2.1 2.8 2.4 2.2 2.3 2.5 2.3 1.8 2.5 2.5 2.3 1.8 1.9
2.1 2.2 2.2 2.1 2.0 1.8 1.5 1.8 1.9 2.5 2.2 1.9 2.0 2.1 1.5 1.6 2.0 1.9 2.2 2.4 2.6 1.9 1.5 1.4 1.9 2.1 2.1 2.2 2.2 1.9 1.9 2.1 2.1 1.8 2.0 1.9
1.6 1.9 2.4 2.3 2.2 2.3 2.0 1.9 2.0 2.1 2.3 2.1 1.6 1.4 1.7 2.0 2.1 2.2 2.3 2.6 3.1 3.1 2.7 1.9 1.7 2.4 2.9 2.4 2.1 1.9 1.4 1.5 1.5 1.5 1.1 1.3
1.7 2.0 2.0 2.4 1.9 2.0 1.7 1.6 2.0 2.2 2.3 2.1 1.5 0.9 1.4 1.9 2.1 1.9 2.0 2.1 2.5 2.5 2.5 2.2 2.4 3.0 2.8 2.5 2.4 1.8 1.5 1.3 1.4 1.5 1.3 1.5
1.9 2.1 2.1 2.2 2.1 2.0 2.0 1.6 1.5 2.0 2.0 1.9 2.0 1.9 1.7 1.9 2.0 1.7 1.4 1.3 1.4 1.5 1.8 2.1 2.7 3.3 2.5 2.0 2.0 1.6 1.4 1.6 1.4 1.2 1.7 1.8
1.3 2.0 2.1 2.3 2.3 2.5 2.5 2.0 1.7 1.6 2.0 2.3 1.6 1.9 2.2 2.2 2.5 2.1 1.7 1.5 1.6 1.6 1.9 2.2 2.7 2.7 2.3 1.9 1.9 1.5 1.5 1.3 1.7 1.4 1.6 1.8
1.1 1.5 1.9 2.3 2.5 2.1 2.0 2.0 1.9 1.4 1.4 1.6 1.3 1.3 1.2 1.0 1.5 1.4 1.3 1.2 1.6 1.8 2.0 1.8 2.0 2.1 1.9 1.5 1.3 1.3 1.5 1.6 1.1 1.2 0.9 0.6
0.6 1.0 1.0 1.5 1.8 1.8 1.5 1.3 1.1 0.9 0.5 1.4 1.1 1.0 0.6 0.9 1.3 1.4 1.2 1.3 1.1 1.1 1.2 1.4 1.5 1.5 1.6 1.3 1.0 0.9 1.0 1.2 0.9 0.7 1.1 0.4
-0.3 -0.1 0.3 1.0 1.2 1.2 0.5 0.8 0.3 -0.2 0.1 0.8 0.0 0.5 0.2 0.5 0.5 1.2 0.9 1.0 0.7 0.7 0.8 1.3 0.5 0.4 0.8 1.1 1.0 0.7 0.5 -0.1 -0.4
0.5 0.5

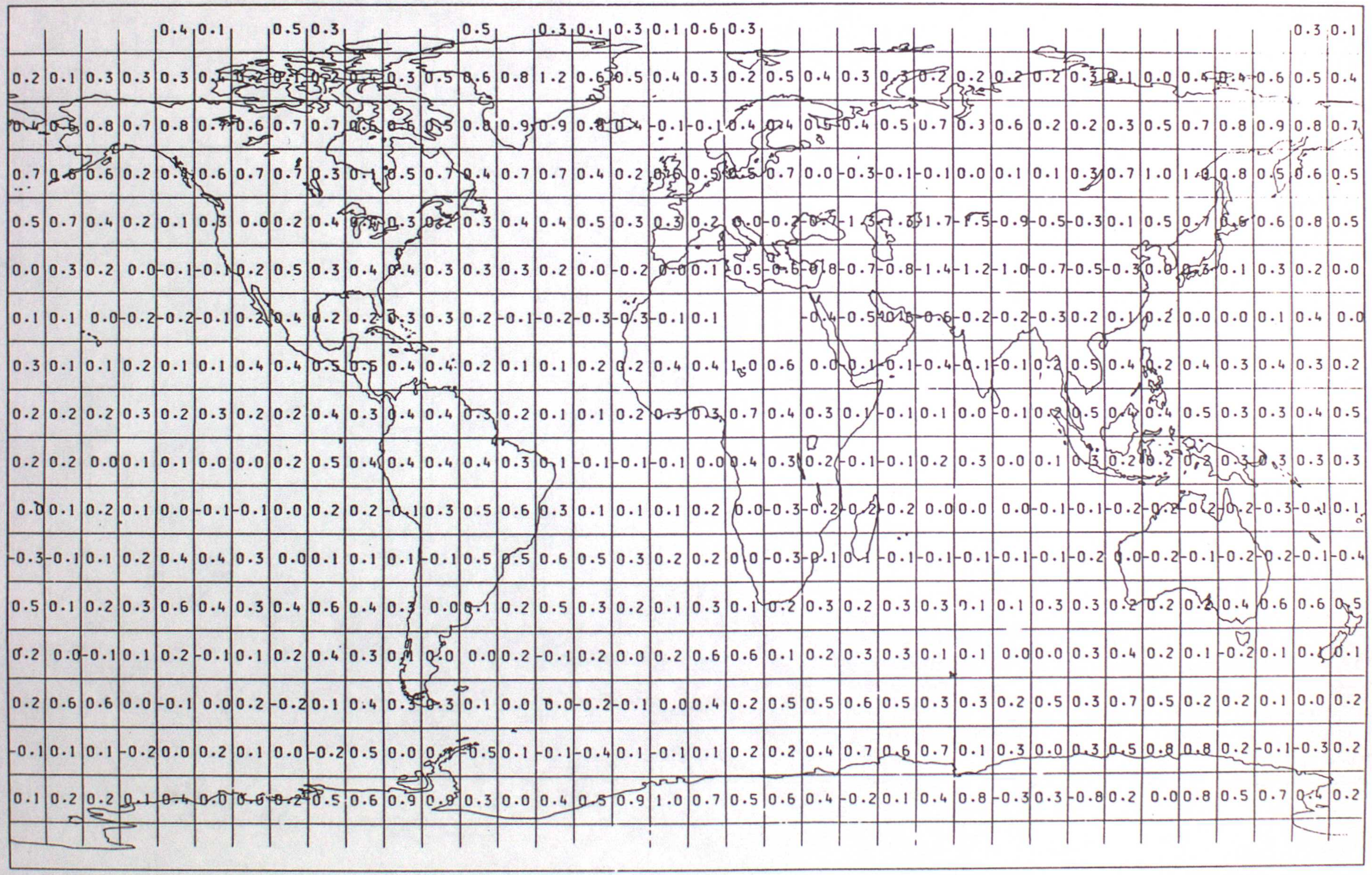
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
JULY 1993
NOAA-12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 26


-0.3 -0.2 -0.7 0.4 0.2 0.5 0.8 0.7 -0.2
-0.1 -0.5 -0.3 -0.9 -0.3 0.3 0.6 -0.3 -0.5 -0.5 0.2 0.1 0.0 0.0 0.9 1.3 1.4 1.6 1.4 1.4 2.9 1.6 1.0 1.6 -1.3 -0.6 -0.3
1.4 1.1 0.4 0.1 0.2 0.6 0.1 0.3 0.1 0.5 0.2 -0.1 0.6 1.3 1.3 1.5 2.0 1.5 2.2 1.8 1.1
0.2 1.5 2.0 1.3 0.1 0.7 1.7 0.8 0.1 0.2 0.6 0.9 0.9 0.9 1.0 0.3 0.2 0.4 1.0 1.5 1.2 0.9 0.4 1.6 0.5 0.6 0.7
0.8 1.1 1.4 1.2 1.2 1.4 -0.8 0.8 0.1 0.0 1.0 1.7 1.6 1.9 0.6 1.4 0.6 1.0 1.6 2.2 -0.1 0.3 1.6 1.2 0.7 0.6
1.4 1.4 1.8 1.9 1.9 0.7 1.9 -0.3 -0.2 0.0 0.6 0.3 0.7 1.3 1.7 1.0 0.6 -1.0 0.3 0.3 0.1 0.4 0.2 0.3 0.7 0.1 0.7
0.6 0.4 1.3 2.5 2.6 0.6 -0.2 0.1 0.2 0.1 0.9 1.0 1.4 2.1 2.7 1.9 -0.9 -0.9 -1.2 -0.9 0.5 0.5 0.7 0.7 0.3 0.6 1.0
0.5 0.0 0.2 0.7 1.2 1.5 1.0 0.2 -0.4 0.1 -0.4 0.7 1.1 1.6 1.3 0.5 -4.1 1.7 -1.6 -0.2 0.7 -0.2 0.8 0.3 0.4 0.5 0.3 0.3 0.3 0.0 0.3
0.9 0.8 0.9 0.8 0.8 1.2 1.4 1.5 1.0 0.5 -2.1 -1.4 -0.5 0.3 0.4 0.7 0.8 -0.2 0.6 0.1 0.4 0.9 0.8 0.4 0.3 1.0 1.0 0.5 0.3 0.7 0.7
1.1 0.9 0.5 0.3 0.4 0.7 1.1 1.6 0.9 -1.2 -2.5 -2.2 -2.4 -1.0 0.2 -0.1 0.7 0.9 -0.1 0.0 0.3 0.3 0.8 0.7 0.2 0.3 0.7 0.8 0.9 0.6 1.1
1.1 1.0 -0.2 0.3 0.8 1.3 1.6 1.8 1.9 0.4 -1.0 -2.9 -2.7 0.4 1.3 2.8 2.5 -0.5 0.8 0.8 0.7 0.9 1.0 1.5 1.9 1.3 0.7 0.9 0.9 1.3
1.7 1.3 0.9 0.6 1.1 1.7 1.7 1.4 1.9 1.3 -0.7 -0.9 0.6 0.3 0.5 1.3 1.7 0.9 -1.4 0.4 0.5 1.0 1.1 0.8 0.2 0.5 1.6 2.9 0.0 0.4 0.9 1.1 1.4
0.5 -0.1 -0.1 -0.7 -0.1 -0.1 0.2 -0.2 0.3 0.4 0.1 -1.8 -0.2 0.6 0.8 -0.1 0.7 0.1 0.4 0.5 -0.2 0.5 0.6 0.7 0.7 0.1 0.2 0.3 -0.2 -0.1 -0.2 -0.4 0.6 1.0 0.9 1.1
0.9 0.4 0.0 0.4 -0.1 0.0 -0.5 -0.1 -0.7 -0.2 -0.4 -0.4 -0.3 0.1 0.0 0.0 -0.1 -0.3 -0.2 -0.1 -0.5 -0.3 -0.3 0.5 0.7 0.2 -0.2 0.2 -0.2 0.1 0.4 0.0 -0.2 -0.2 0.2 -0.3
-0.4 -0.4 -1.0 -0.1 -0.8 -0.8 -1.4 -1.3 -1.4 -1.4 -1.5 -0.7 -1.3 -0.8 0.2 -0.5 -0.8 -0.7 -2.0 -1.5 -1.7 -1.4 -1.4 -0.7 -0.8 -2.0 -0.8 -1.2 -1.8 -1.8 -1.4 -0.5 -1.0 -0.2 -0.4 -0.7
-1.6 -1.2 -1.9 -1.7 -1.7 -1.4 -1.8 -1.7 -2.2 -1.3 -1.4 -1.1 -0.9 -0.9 -0.5 -0.2 -0.4 -0.9 -0.6 -1.3 -0.9 -1.5 -0.4 0.3 -0.6 -1.4 -1.2 -1.2 -2.2 -1.7 -0.7 -0.5 -2.0 -0.9 -1.0
-2.4 -3.2 -2.6 -3.4 -1.5 -0.7 -2.1 -0.8 -0.7 -2.0 -0.9 -1.3 -0.7 -2.5 -2.2

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
JULY 1993
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 27

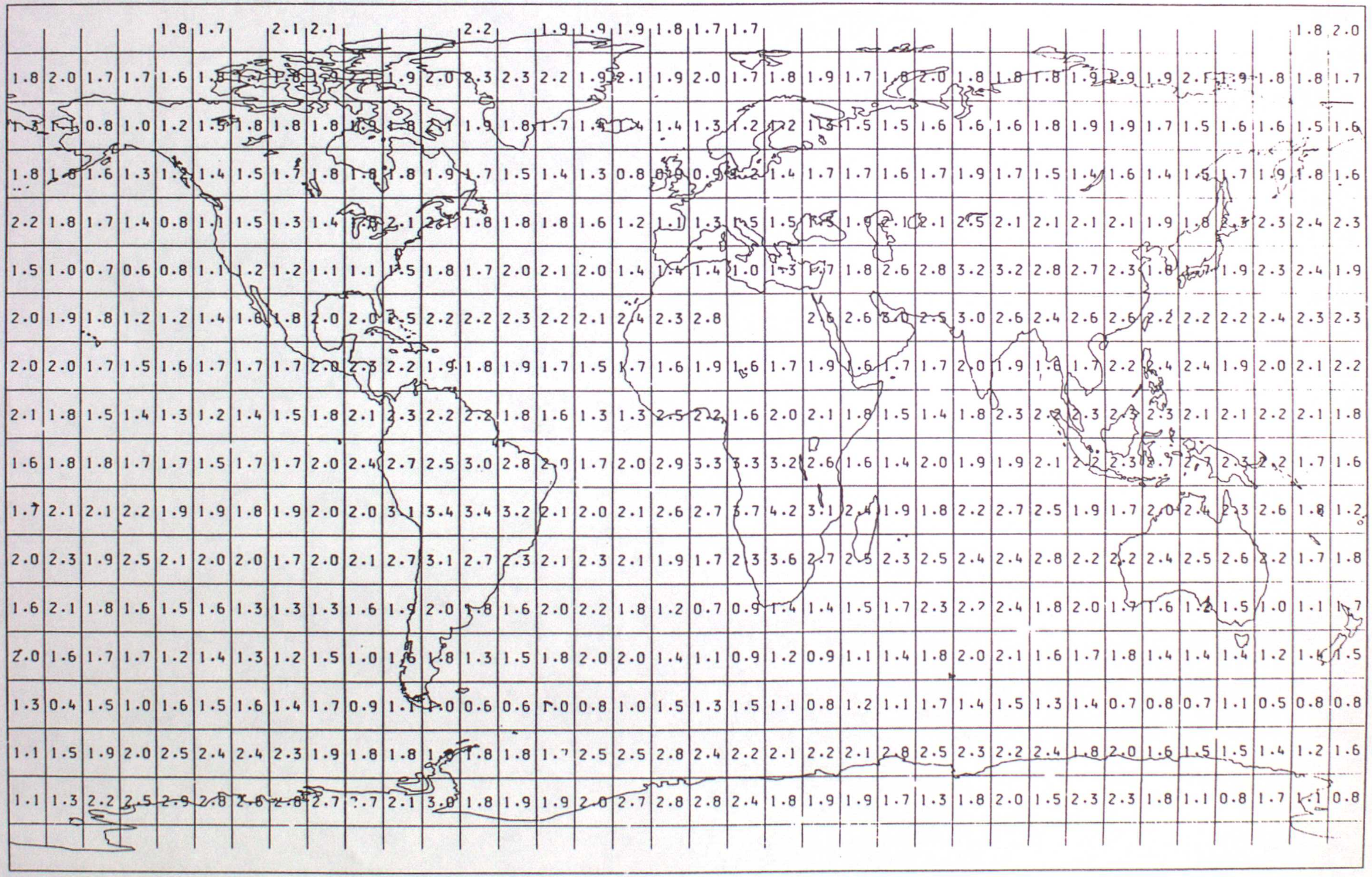

0.4 0.1 0.5 0.3 0.5 0.3 0.1 0.3 0.1 0.6 0.3 0.3 0.1
0.2 0.1 0.3 0.3 0.3 0.4 0.2 0.1 0.2 0.4 0.3 0.5 0.6 0.8 1.2 0.6 0.5 0.4 0.3 0.2 0.5 0.4 0.3 0.3 0.2 0.2 0.2 0.2 0.3 0.1 0.0 0.4 0.4 0.6 0.5 0.4
0.4 0.6 0.8 0.7 0.8 0.7 0.6 0.7 0.7 0.6 0.6 0.5 0.8 0.9 0.9 0.8 0.4 -0.1 -0.1 0.4 0.4 0.5 0.4 0.5 0.7 0.3 0.6 0.2 0.2 0.3 0.5 0.7 0.8 0.9 0.8 0.7
0.7 0.6 0.6 0.2 0.4 0.6 0.7 0.7 0.3 0.1 0.5 0.7 0.4 0.7 0.7 0.4 0.2 0.6 0.5 0.5 0.7 0.0 -0.3 -0.1 -0.1 0.0 0.1 0.1 0.3 0.7 1.0 1.0 0.8 0.5 0.6 0.5
0.5 0.7 0.4 0.2 0.1 0.3 0.0 0.2 0.4 [illegible] 0.3 0.2 0.3 0.4 0.4 0.5 0.3 0.3 0.2 0.0 -0.2 -0.7 -1.3 -1.6 -1.7 -1.5 -0.9 -0.5 -0.3 0.1 0.5 0.7 0.6 0.6 0.8 0.5
0.0 0.3 0.2 0.0 -0.1 -0.1 0.2 0.5 0.3 0.4 0.4 0.3 0.3 0.3 0.2 0.0 -0.2 0.0 0.1 -0.5 -0.6 -0.8 -0.7 -0.8 -1.4 -1.2 -1.0 -0.7 -0.5 -0.3 0.0 0.3 -0.1 0.3 0.2 0.0
0.1 0.1 0.0 -0.2 -0.2 -0.1 0.2 0.4 0.2 0.2 0.3 0.3 0.2 -0.1 -0.2 -0.3 -0.3 -0.1 0.1 -0.4 -0.5 -0.6 -0.6 -0.2 -0.2 -0.3 0.2 0.1 0.2 0.0 0.0 0.1 0.4 0.0
0.3 0.1 0.1 0.2 0.1 0.1 0.4 0.4 0.5 0.5 0.4 0.4 0.2 0.1 0.1 0.2 0.2 0.4 0.4 1.0 0.6 0.0 -0.1 -0.1 -0.4 -0.1 -0.1 0.2 0.5 0.4 0.2 0.4 0.3 0.4 0.3 0.2
0.2 0.2 0.2 0.3 0.2 0.3 0.2 0.2 0.4 0.3 0.4 0.4 0.3 0.2 0.1 0.1 0.2 0.3 0.3 0.7 0.4 0.3 0.1 -0.1 0.1 0.0 -0.1 0.2 0.5 0.4 0.4 0.5 0.3 0.3 0.4 0.5
0.2 0.2 0.0 0.1 0.1 0.0 0.0 0.2 0.5 0.4 0.4 0.4 0.4 0.3 0.1 -0.1 -0.1 -0.1 0.0 0.4 0.3 0.2 -0.1 -0.1 0.2 0.3 0.0 0.1 0.3 0.2 0.2 0.2 0.3 0.3 0.3 0.3
0.0 0.1 0.2 0.1 0.0 -0.1 -0.1 0.0 0.2 0.2 -0.1 0.3 0.5 0.6 0.3 0.1 0.1 0.1 0.2 0.0 -0.3 -0.2 -0.2 -0.2 0.0 0.0 0.0 -0.1 -0.1 -0.2 -0.2 -0.2 -0.2 -0.3 -0.1 0.1
-0.3 -0.1 0.1 0.2 0.4 0.4 0.3 0.0 0.1 0.1 0.1 -0.1 0.5 0.5 0.6 0.5 0.3 0.2 0.2 0.0 -0.3 -0.1 0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.2 0.0 -0.2 -0.1 -0.2 -0.2 -0.1 -0.4
0.5 0.1 0.2 0.3 0.6 0.4 0.3 0.4 0.6 0.4 0.3 0.0 0.1 0.2 0.5 0.3 0.2 0.1 0.3 0.1 0.2 0.3 0.2 0.3 0.3 0.1 0.1 0.3 0.3 0.2 0.2 0.2 0.4 0.6 0.6 0.5
0.2 0.0 -0.1 0.1 0.2 -0.1 0.1 0.2 0.4 0.3 0.1 0.0 0.0 0.2 -0.1 0.2 0.0 0.2 0.6 0.6 0.1 0.2 0.3 0.3 0.1 0.1 0.0 0.0 0.3 0.4 0.2 0.1 -0.2 0.1 0.1 0.1
0.2 0.6 0.6 0.0 -0.1 0.0 0.2 -0.2 0.1 0.4 0.3 0.3 0.1 0.0 0.0 -0.2 -0.1 0.0 0.4 0.2 0.5 0.5 0.6 0.5 0.3 0.3 0.2 0.5 0.3 0.7 0.5 0.2 0.2 0.1 0.0 0.2
-0.1 0.1 0.1 -0.2 0.0 0.2 0.1 0.0 -0.2 0.5 0.0 [illegible] -0.5 0.1 -0.1 -0.4 0.1 -0.1 0.1 0.2 0.2 0.4 0.7 0.6 0.7 0.1 0.3 0.0 0.3 0.5 0.8 0.8 0.2 -0.1 -0.3 0.2
0.1 0.2 0.2 0.1 0.4 0.0 0.6 0.2 0.5 0.6 0.9 0.9 0.3 0.0 0.4 0.5 0.9 1.0 0.7 0.5 0.6 0.4 -0.2 0.1 0.4 0.8 -0.3 0.3 -0.8 0.2 0.0 0.8 0.5 0.7 0.4 0.2

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA

JULY 1993 FIGURE 28

NOAA-12. USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.8 1.7 2.1 2.1 2.2 1.9 1.9 1.9 1.8 1.7 1.7 1.8 2.0
1.8 2.0 1.7 1.7 1.6 1.8 1.7 1.8 [illegible] 2.1 1.9 2.0 2.3 2.3 2.2 1.9 2.1 1.9 2.0 1.7 1.8 1.9 1.7 1.8 2.0 1.8 1.8 1.8 1.9 2.9 1.9 2.1 1.9 1.8 1.8 1.7
1.3 1.1 0.8 1.0 1.2 1.5 1.8 1.8 1.8 1.9 1.8 2.1 1.9 1.8 1.7 1.4 1.4 1.4 1.3 1.2 1.2 1.3 1.5 1.5 1.6 1.6 1.6 1.8 1.9 1.9 1.7 1.5 1.6 1.6 1.5 1.6
1.8 1.8 1.6 1.3 1.2 1.4 1.5 1.7 1.8 1.8 1.8 1.9 1.7 1.5 1.4 1.3 0.8 0.9 0.9 1.2 1.4 1.7 1.7 1.6 1.7 1.9 1.7 1.5 1.4 1.6 1.4 1.5 1.7 1.9 1.8 1.6
2.2 1.8 1.7 1.4 0.8 1.1 1.5 1.3 1.4 1.8 2.1 2.1 1.8 1.8 1.8 1.6 1.2 1.1 1.3 1.5 1.5 1.5 1.9 2.1 2.1 2.5 2.1 2.1 2.1 2.1 1.9 1.8 2.3 2.3 2.4 2.3
1.5 1.0 0.7 0.6 0.8 1.1 1.2 1.2 1.1 1.1 1.5 1.8 1.7 2.0 2.1 2.0 1.4 1.4 1.4 1.0 1.3 1.7 1.8 2.6 2.8 3.2 3.2 2.8 2.7 2.3 1.8 1.7 1.9 2.3 2.4 1.9
2.0 1.9 1.8 1.2 1.2 1.4 1.6 1.8 2.0 2.0 2.5 2.2 2.2 2.3 2.2 2.1 2.4 2.3 2.8 2.6 2.6 3.0 2.5 3.0 2.6 2.4 2.6 2.6 2.2 2.2 2.2 2.4 2.3 2.3
2.0 2.0 1.7 1.5 1.6 1.7 1.7 1.7 2.0 2.3 2.2 1.9 1.8 1.9 1.7 1.5 1.7 1.6 1.9 1.6 1.7 1.9 1.6 1.7 1.7 2.0 1.9 1.6 1.7 2.2 2.4 2.4 1.9 2.0 2.1 2.2
2.1 1.8 1.5 1.4 1.3 1.2 1.4 1.5 1.8 2.1 2.3 2.2 2.2 1.8 1.6 1.3 1.3 2.5 2.2 1.6 2.0 2.1 1.8 1.5 1.4 1.8 2.3 2.2 2.3 2.3 2.3 2.1 2.1 2.2 2.1 1.8
1.6 1.8 1.8 1.7 1.7 1.5 1.7 1.7 2.0 2.4 2.7 2.5 3.0 2.8 2.0 1.7 2.0 2.9 3.3 3.3 3.2 2.6 1.6 1.4 2.0 1.9 1.9 2.1 2.2 2.3 2.7 2.7 2.3 2.2 1.7 1.6
1.7 2.1 2.1 2.2 1.9 1.9 1.8 1.9 2.0 2.0 3.1 3.4 3.4 3.2 2.1 2.0 2.1 2.6 2.7 3.7 4.2 3.1 2.4 1.9 1.8 2.2 2.7 2.5 1.9 1.7 2.0 2.4 2.3 2.6 1.8 1.2
2.0 2.3 1.9 2.5 2.1 2.0 2.0 1.7 2.0 2.1 2.7 3.1 2.7 2.3 2.1 2.3 2.1 1.9 1.7 2.3 3.6 2.7 2.5 2.3 2.5 2.4 2.4 2.8 2.2 2.2 2.4 2.5 2.6 2.2 1.7 1.8
1.6 2.1 1.8 1.6 1.5 1.6 1.3 1.3 1.3 1.6 1.9 2.0 1.8 1.6 2.0 2.2 1.8 1.2 0.7 0.9 1.4 1.4 1.5 1.7 2.3 2.7 2.4 1.8 2.0 1.7 1.6 1.2 1.5 1.0 1.1 1.7
2.0 1.6 1.7 1.7 1.2 1.4 1.3 1.2 1.5 1.0 1.6 1.8 1.3 1.5 1.8 2.0 2.0 1.4 1.1 0.9 1.2 0.9 1.1 1.4 1.8 2.0 2.1 1.6 1.7 1.8 1.4 1.4 1.4 1.2 1.4 1.5
1.3 0.4 1.5 1.0 1.6 1.5 1.6 1.4 1.7 0.9 1.1 1.0 0.6 0.6 1.0 0.8 1.0 1.5 1.3 1.5 1.1 0.8 1.2 1.1 1.7 1.4 1.5 1.3 1.4 0.7 0.8 0.7 1.1 0.5 0.8 0.8
1.1 1.5 1.9 2.0 2.5 2.4 2.4 2.3 1.9 1.8 1.8 1.8 1.8 1.8 1.7 2.5 2.5 2.8 2.4 2.2 2.1 2.2 2.1 2.8 2.5 2.3 2.2 2.4 1.8 2.0 1.6 1.5 1.5 1.4 1.2 1.6
1.1 1.3 2.2 2.5 2.9 2.8 2.8 2.8 2.7 2.7 2.1 3.0 1.8 1.9 1.9 2.0 2.7 2.8 2.8 2.4 1.8 1.9 1.9 1.7 1.3 1.8 2.0 1.5 2.3 2.3 1.8 1.1 0.8 1.7 1.1 0.8